The influence of a flipped classroom on the learning approaches of first-year Speech-Language and Hearing Therapy students

MONIQUE VISSER

Research Assignment

submitted in partial fulfilment of the requirement for the degree of Master of Philosophy in Health Professions Education in the Faculty of Medicine and Health Sciences at Stellenbosch University

Supervisor: Dr AJN Louw

Co-supervisor: Mr J Van As

March 2018

Declaration

By submitting this assignment electronically, I, Monique Visser, declare that the entirety of the work contained therein is my own, original work, that I am the sole author thereof (save to the extent explicitly otherwise stated), that reproduction and publication thereof by Stellenbosch University will not infringe any third-party rights and that I have not previously in its entirety or in part submitted it for obtaining any qualification.

December 2017

Monique Visser

Acknowledgements

I would like to express my deepest appreciation to all those who made it possible for me to complete this report. A special note of gratitude to my supervisors, Dr Alwyn Louw and Mr Janus van As, who contributed greatly in offering stimulating suggestions as well as encouragement to assist me in completing the project and writing this report.

Furthermore, I would like to acknowledge with much appreciation the crucial role of the students who agreed to participate in the focus groups following the flipped classrooms for this project. Thank you for sharing this journey with me!

My sincerest thank you to Lilané Joubert for editing this report in record time. I am forever grateful that I have a proofreader sister who loves me enough to take on something that I wrote – in English!

This journey would also not have been possible without the immense support of my parents. I wish to thank them for showing up whenever we needed them! Your love and encouragement enabled me to embrace this challenge.

Finally, I must express my profound gratitude to Eugene for providing me with unfailing support and continuous encouragement throughout my studies. This accomplishment would not have been possible without you. Thank you for allowing me the time and space to complete this project. I am sure Zak and Lika will be missing the outings over weekends!

Soli Deo Gloria.

Abstract

Students base their approaches to learning on their perceptions of the educational practices that they are exposed to. The significance of selected educational models is therefore not to be underestimated in higher education. The main aim of this study was to explore the influence of a flipped classroom on first-year Speech-Language and Hearing Therapy students' approaches toward learning. After being exposed to a series of four consecutive flipped classrooms over a four-week period, 24 students participated in focus groups about their learning experiences during the flipped instruction. Qualitative, descriptive data analysis was conducted to explore students' engagement in three critical types of activities for quality of learning: (a) cognitive processing; (b) affection or motivation; and (c) metacognitive regulation (Vermunt & Verloop, 1999). Results showed that the flipped classroom model facilitated the participants' engagement in cognitive processing, fostered intrinsic motivation and encouraged metacognitive activity. This study adds to the existing literature on effective instructional models in health professions education and provides guidance to educators in utilising this educational model to promote a deep approach to learning. Finally, this study emphasises the importance of curricular design and the crucial role of learning experiences when preparing students for their future careers. Recommendations for future research are discussed.

Opsomming

Studente baseer hul benaderings tot leer op hul persepsies van die opvoedkundige praktyke waaraan hulle blootgestel word (Ramsden, Reynolds, & Brown, 1988). Die rol van geselekteerde opvoedkundige modelle in hoër onderwys behoort dus nie onderskat te word nie. Die hoofdoel van hierdie studie was om die invloed van ’n omgekeerde klaskamer (“flipped classroom”) op Spraak-Taal en Gehoorterapie-studente in hul eerste jaar se benaderings tot leer te verken. Na afloop van blootstelling aan ’n reeks van vier opeenvolgende omgekeerde klaskamers, het 24 studente aan fokusgroepe oor hulle leerervarings tydens die omgekeerde onderrig deelgeneem. Kwalitatiewe, beskrywende data-ontleding is uitgevoer om studente se betrokkenheid in drie kritiese tipe aktiwiteite vir kwaliteitleer te verken: (a) kognitiewe prosessering, (b) affeksie of motivering en (c) metakognitiewe regulering (Vermunt & Verloop, 1999). Resultate het aangedui dat die omgekeerdeklaskamermodel kognitiewe prosessering by die deelnemers gefasiliteer het, intrinsieke motivering gekoester het en metakognisie aangemoedig het. Hierdie studie lewer ’n bydrae tot die bestaande literatuur oor effektiewe onderrigmodelle in gesondheidsberoepe-onderrig en verskaf leiding aan opvoeders wat hierdie opvoedkundige model benut om ’n diep benadering tot leer te bevorder. Laastens beklemtoon die studie die belang van kurrikulêre ontwerp en die kritieke rol wat studente se leerervarings speel wanneer hulle vir hul toekomstige beroepe voorberei word. Aanbevelings vir toekomstige navorsing word bespreek.

Contents

Abstract iv

Opsomming v

List of Tables x

List of Figures xi

Chapter 1: Overview 1

1.1 Introduction 1

1.2 Research Question 3

1.3 Research Aims 3

1.4 Delineations and Limitations 3

1.5 Significance of the Study 4

1.6 Report Outline 5

Chapter 2: Literature Perspectives 6

2.1. Introduction 6

2.2 Defining the Flipped Classroom 6

2.3 Characteristics of Flipped Instruction 7

2.4 The Flipped Classroom as a Strategy to Promote Active Learning 9

2.5 The Benefits of Flipped Classrooms for Lecturers 9

2.6 Benefits for Students Participating in Flipped Classrooms 10

2.7 Students' Experiences of the Flipped Classroom 13

2.8 The Role of Flipped Classrooms in Fostering a Deep Approach to Learning 14

2.8.1 Cognitive processing 15

2.8.2 Affective activities and motivation 17

2.8.3 Metacognitive regulation 19

2.9 The Significance of a Deep Approach Toward Learning for Health Professions Education 24

2.10 Challenges Associated with Implementation of the Flipped Classroom 24

2.11 Conclusion 25

Chapter 3: Methodology 26

3.1 Introduction 26

3.2 Research Design 26

3.3 Research Instruments 26

3.3.1 Flipped classrooms. 26

3.3.2 Introductory podcast 27

3.3.3 Discussion guide. 28

3.4 Data 28

3.4.1 Participants. 28

3.4.2 Sampling 29

3.4.3 Selection criteria 29

3.5 Research Procedures 30

3.5.1 Implementation of the flipped classrooms. 30

3.5.2 Data collection. 30

3.5.3 Preparation of the data. 31

3.6 Data analysis 31

3.7 Trustworthiness 32

3.8 Ethical Considerations 33

Chapter 4: Results and Discussion 34

4.1 Introduction 34

4.2 Theme 1: Cognitive Processing 35

4.2.1 Category 1: Addressing the individual student's cognitive needs 35

4.2.2 Category 2: Pre-learning sessions 36

4.2.3 Category 3: Opportunities for practice 36

4.2.4 Category 4: Access to feedback 37

4.2.5 Discussion of the results of Theme 1: Cognitive processing during flipped classrooms 37

4.3 Theme 2: Motivation 39

4.3.1 Category 1: Control over own learning process 39

4.3.2 Category 2: Opportunities to experience success 40

4.3.3 Category 3: Relevance of learning activities for career 41

4.3.4 Category 4: Community for learning 41

4.3.5 Discussion of the results of Theme 2: Motivation during flipped classrooms 42

4.4 Theme 3: Metacognitive Regulation 44

4.4.1 Category 1: Pre-class learning in preparation of contact time 45

4.4.2 Category 2: Opportunities for feedback 45

4.4.3 Category 3: New learning experience 46

4.4.4 Discussion of the results of Theme 3: Metacognitive regulation during flipped classrooms 46

4.5 Conclusion 47

Chapter 5: Conclusion 48

5.1 Introduction 48

5.2 Summary of Findings 48

5.3 Strengths and Limitations 49

5.4 Recommendations for Future Research 50

Reference List 51

Appendix A 62

Appendix B 69

Appendix C 70

Appendix D 71

List of Tables

Table 2.1:	The key characteristics of flipped classrooms……..…	7
Table 2.2:	The benefits that implementation of flipped classrooms hold for lecturers……..	10
Table 2.3:	Studies providing evidence of the positive impact of the flipped classroom on students' academic achievement……..	11
Table 2.4:	The three basic psychological needs (Deci, Koestner, & Ryan, 1999) for establishing intrinsic motivation with the associated principles of a flipped classroom……..……....	18
Table 2.5:	Vermunt and Verloop's (1999) metacognitive regulative activities and the characteristics of a flipped classroom that are congruent with these activities…….	21
Table 3.1	The diversity profile of the study population…….	28
Table 4.1	The main themes and categories from the results……..……	34

List of Figures

Figure 3.1: Nine design principles for flipped classrooms..…….. 27

Figure 3.2: Saldana's (2009) codes-to-theory model for qualitative inquiry…….. 32

Chapter 1: Overview

1.1 Introduction

Lecturers in higher education today can identify with Biggs's (1999) statement that many students “seem not to be coping” (p.57). Often it seems as if these students should not be at university at all. Research supports this notion, suggesting that a substantial portion of students are not presenting with the critical thinking and reasoning skills considered to be fundamental to higher education (McLaughlin et al., 2014). As a result, there has been an appeal for a shift in health professions education, away from traditional lecturing methodologies toward instructional approaches that encourage higher-order reasoning and active involvement of students (Chen, Lui, & Martinelli, 2017).

In addition, Crisp and Chen (2014) called for education that reflects the various, yet complementary roles that students in the health professions would be required to fulfil once qualified. Education needs to prepare students not only to serve as functionaries in a particular health care system, but should equip them as researchers, scientists, leaders, change agents and managers (Crisp & Chen, 2014). In accordance, Roehl, Reddy, and Shannon (2013) emphasised the importance of incorporating attainment of vital skills such as critical reasoning, effective communication, collaboration and creativity (Blair, 2012 as cited in Roehl et al., 2013) into training, as that would increase the likelihood for effective application of these competencies in the workplace. Research shows that a flipped classroom teaching model[1] offers the prospect of providing these opportunities in education (Bishop & Verleger, 2013; Ferreri & O’Connor, 2013; McLaughlin et al., 2014; Milman, 2012; Strayer, 2012; Zainuddin & Halili, 2016).

Furthermore, evidence of the positive outcomes of the flipped classroom approach is presented in the literature on the topic (Enfield, 2013; Ferreri & O’Connor, 2013; Hanson, 2016; Koo et al., 2016; Mason, Shuman, & Cook, 2013; O’Flaherty & Phillips, 2015; Pierce & Fox, 2012; Zainuddin & Halili, 2016). McLaughlin et al. (2014) however reported mixed results with regard to the skill set gains associated with flipped

[1] The flipped classroom is an instructional model in which students gain first exposure learning prior to class and focus on the processing part of learning (synthesising, analysis, problem solving) in class. A more expounded definition can be found in Chapter 2, Section 2.2 of this report.

classrooms, while other studies concluded that the impact was at least as effective as traditional instructional methods (Chen et al., 2017; Davies, Dean, & Ball, 2013; Galway, Corbett, Takaro, Tairyan, & Frank, 2014).

Previous studies investigated the impact of flipped classrooms by measuring students' performance (Ferreri & O'Connor, 2013; Hawks, 2014; Koo et al., 2016; Liebert, Lin, Mazer, Bereknyei, & Lau, 2016; Mason et al., 2013; McLaughlin et al., 2014; Missildine, Fountain, Summers, & Gosselin, 2013; Mortensen & Nicholson, 2015; Pierce & Fox, 2012), class attendance (Prober & Khan, 2013), and perceptions (Galway et al., 2014; Hanson, 2016; Koo et al., 2016; McLaughlin et al., 2013). However, since meaning is created through students' learning activities (Biggs, 1999), rather than being transmitted through instruction, the current study aimed at exploring students' engagement in *activities associated with quality learning* as identified by Vermunt and Verloop (1999), as opposed to measuring learning *per se,* which would have entailed the measurement of the attainment of learning outcomes by means of assessments such as examinations or tests (Prince, 2004).

Biggs (1999) claimed that students' learning activities can be "well summarised as [their] approach(es) to learning" (p. 60). Consequently, the title of this study emerged as *The influence of a flipped classroom on the learning approaches of first-year Speech-Language and Hearing Therapy students.*

It is important to acknowledge that a student's approach toward learning is not a personality trait, but rather refers to the student's preferred *way* of learning (Biggs, 1999). Of particular relevance for the current study is the suggestion that although students' approaches toward learning can be attributed to individual qualities such as academic ability and locus of control, the situational environment, particularly the educational practices, play a key role in students' adoption of ways of learning (Wang et al. as cited in Biggs, 1987). This notion is strongly supported by Ramsden, Reynolds, & Brown (1988) who aver that students adapt their learning strategies based on their perceptions of the chosen method of teaching. On a practical level, this implies that even students who have adopted a deep approach toward learning, but are overloaded with course content or are evaluated only on memorised facts, may consequently adopt a surface approach (Donald, 2002).

1.2 Research Question

As a result of the significant potential selected educational models hold, the current study aimed to address the research question: *How would a flipped classroom influence the learning approaches of first-year Speech-Language and Hearing Therapy students?*

1.3 Research Aims

The main aim of the study was to explore the influence of a flipped classroom on the participants' approaches toward learning. This was done through investigating their engagement in activities of cognition, metacognition and intrinsic motivation during flipped classrooms as these were identified by Vermunt and Verloop (1999) as crucial activities for quality of learning.

The specific objectives for the study were:

- To determine if the flipped classroom teaching strategy influence the approach students adopt toward learning in this specific module
- To explore the influence the flipped classroom strategy has on the way students engage cognitively with the content matter
- To find out if the flipped classroom strategy has any influence on the intrinsic motivation at students toward learning in this module
- To determine if the flipped classroom strategy has improved metacognition activities at students while learning in this module.

1.4 Delineations and Limitations

Four lectures from a six-credit module that teaches theory and skills associated with the intervention of children with articulation and phonological disorders, were utilised for the purposes of the study. The study was therefore delineated to involve first-year Speech-Language and Hearing Therapy students at a single academic institution at the time of the study (between the months of July and October 2017). It should be noted that these delineations may limit the generalisability of the findings.

Furthermore, it should be noted that the study explored the potential and opportunities offered by a specific educational model, namely the flipped classroom, through implementing the model and investigating the types of activities students engaged with

during the flipped classes. The findings of the study therefore do not offer conclusions about the influence of other educational methods, or more traditional approaches to teaching, on students' adoption of deep approaches toward learning.

1.5 Significance of the Study

The learning outcomes of the articulation and phonological disorders module at the university where this study was conducted, required students to reason about clinical cases, analyse clinical data and compile individualised intervention plans for children with articulation and phonological disorders. These outcomes required higher-order cognitive skills according to Bloom's taxonomy of learning (Krathwohl et al., 2002). After revisiting the assessments of the module, the assignments, test and examination questions were adapted to better align with these learning outcomes.

In order to achieve what Biggs (1999) described as "constructive alignment" (p. 64), the next step required employing teaching methods in the module that would prepare students for these assessments and be likely to realise these outcomes. The flipped classroom teaching model posed the ideal design to engage students in the deep approach to learning necessitated by the learning outcomes of the module.

Although a literature review revealed numerous studies that investigated the flipped classroom as an educational model, no studies were found that specifically explored students' approaches toward learning by investigating their engagement in cognitive processing, metacognitive regulation and their motivation during a flipped classroom. Moreover, no other studies were found that investigated or utilised flipped classrooms in the discipline of Speech-Language and Hearing Therapy. The findings of this study may be transferable to other modules of the programme Baccalaureus of Speech-Language and Hearing Therapy at the particular university, as well as to other programmes and other universities where lecturers wish to explore innovative educational models and facilitate learning experiences that will promote students' engagement in activities associated with quality learning. Finally, this study may provide guidance for educators who wish to critically self-appraise their current teaching practices.

1.6 Report Outline

Chapter 1 provides a brief overview of the study. Chapter 2 presents a definition and the characteristics of flipped instruction. In addition, it also explores the flipped classroom as a strategy to promote active learning and the educational value it contributes. Furthermore, Chapter 2 includes discussions of the role of the flipped classroom in fostering a deep approach toward learning, as well as the significance of students in the health professions adopting this approach toward learning. Chapter 2 concludes with challenges associated with the flipped classroom as educational model.

Chapter 3 presents the study methodology, including justification of the study design, data collection and analysis. The findings as well as a discussion of the findings in relation to the literature are explored in Chapter 4. Finally, Chapter 5 concludes the findings of the study and its practical implications, together with recommendations for future research.

Chapter 2: Literature Perspectives

2.1. Introduction

This chapter aims to provide an overview of the current state of research on flipped classrooms. Evidence that flipped classrooms are being implemented in higher education was increasingly published during the last century. As a point of departure, the definitions for a flipped classroom provided by authors on the topic will be presented. Subsequently a discussion of the characteristics of a flipped classroom and its potential as a strategy for active learning will be explored. The value that this educational model can add, as well as the role of the flipped classroom in fostering a deep approach toward learning, will be addressed next. Finally, the significance of a deep approach toward learning in health professions education and the challenges associated with flipped classrooms will be presented.

2.2 Defining the Flipped Classroom

The flipped classroom requires students to engage with learning content in their own time in preparation for the next lecture encounter they will have. Contact time with the lecturer during class time is then utilised for interactive and cooperative learning activities and the opportunity for application and problem solving (Bishop & Verleger, 2013; Carvalho & McCandless, 2014; Prober & Khan, 2013; Shimamoto, 2012). This sequence of activities is the opposite of conventional practice where theoretical knowledge is delivered during lectures, followed by learning activities where students have to apply what was learnt in their own time after class. Therefore, the term *flipped* is deemed appropriate since the conventional in-class and out-of-class teaching and learning activities are switched or inverted when the flipped classroom method is employed.

Although references to *reverse instruction* (Herreid & Schiller, 2013), *inverted classrooms* (Gannod, Burge, & Helmick, 2008; Lage & Platt, 2000; Roehl et al., 2013; Strayer, 2012) and *backwards classrooms* (McLaughlin et al., 2014) are also found, the term *flipped classroom* is the most common reference for this educational model in the literature.

Probably owing to the fact that the term *flipped classroom* was coined as recently as 2012 only (Young, Bailey, Guptill, Thorp, & Thomas, 2014), publications covering this

topic almost in every instance introduce this educational model to readers by providing a definition and explanations regarding what it entails.

A wide variety of definitions is presented in the literature (Carvalho & McCandless, 2014; Chen et al., 2017; Enfield, 2013; Herreid & Schiller, 2013; Kim, Kim, Khera, & Getman, 2014; McLaughlin et al., 2014; Milman, 2012; Nwosisi, Ferreira, Rosenberg, & Walsh, 2016; O'Flaherty & Phillips, 2015; Prober & Khan, 2013; Roehl et al., 2013; Zainuddin & Halili, 2016). However, most papers defining the flipped classroom model make reference to pre-recorded lectures aimed at teaching basic concepts, and studied by students in their own time, followed by engagement and facilitated learning during valuable contact time.

After exploring what is meant by the term *flipped classroom*, it is equally important to address what it is not. In their article *The Flipped Classroom: Myth vs. Reality* on the website The Daily Riff, Bergmann, Overmyer and Wilie (2011) emphasise that online videos are not a synonym for a flipped classroom. In accordance, Milman (2012) points out that flipping your class involves more than recording and sharing video lectures with students for watching in their own time. When engaging around the topic of flipped classrooms, it should always be emphasised that the meaningful learning activities and interaction during the contact time component of a flipped classroom are equally crucial to the successful implementation of this model.

2.3 Characteristics of Flipped Instruction

In Table 2.1 below, the key characteristics of flipped classrooms as revealed during a literature review, are presented.

Table 2.1. The key characteristics of flipped classrooms

Characteristics of the Flipped Classroom Model	**References**
Teaching and learning events comprise both pre-class activities as well as face-to-face learning sessions.	Carvalho & McCandless (2014); Chen et al. (2017); Enfield (2013); Herreid & Schiller (2013); Karabulut-Ilgu, Jaramillo Cherrez, & Jahren (2017); Lowell Bishop & Verleger (2013); McLaughlin et al.

	(2014); Milman (2012); Nwosisi et al. (2016); O'Flaherty & Phillips (2015); Roehl et al. (2013); Zainuddin & Halili (2016)
Pre-class teaching and learning activities are student-centred and student-paced.	Carvalho & McCandless (2014); Chen et al. (2017); Fulton (2012); Kim et al. (2014); O'Flaherty & Phillips (2015); Wood, Jensen, Bezdek, & Otto (2001)
Pre-class activities usually entail interaction with technology (recorded lectures, participation in online learning activities, etc.).	Bishop & Verleger (2013); Karabulut-Ilgu et al. (2017); Kim et al. (2014); Nwosisi et al. (2016); O'Flaherty & Phillips (2015); Zainuddin & Halili (2016)
Contact time is interactive in nature and provides opportunity for learning through application and problem solving.	Carvalho & McCandless (2014); Chen et al. (2017); Herreid & Schiller (2013); Karabulut-Ilgu et al. (2017); Kim et al. (2014); Lowell Bishop & Verleger (2013); McLaughlin et al. (2014); Milman (2012); Nwosisi et al. (2016); O'Flaherty & Phillips (2015); Roehl et al. (2013); Zainuddin & Halili (2016)
Pre-class activity serves as preparation to engage optimally in class.	Carvalho & McCandless (2014); Chen et al. (2017); Milman (2012); McLaughlin et al. (2014); Nwosisi et al. (2016); O'Flaherty & Phillips (2015).
Teaching and learning activities during this model encourage collaboration, discussion and peer-instruction.	Bishop & Verleger (2013); Karabulut-Ilgu et al. (2017); Kim et al. (2014); McLaughlin et al. (2014); Nwosisi et al. (2016); Tucker (2012).

In summary, it is concluded from the literature that the flipped classroom model entails two components for learning: an in-class and out-of-class learning session. Out-of-class sessions usually utilise a form of technology and serve as preparation for the contact time. In addition, the out-of-class learning of a flipped classroom should be offered in a student-centred manner, placing students in control of their own learning. Furthermore, it is evident from the literature that in addition to the out-of-class component, implementing a flipped classroom requires a highly interactive contact

time component that offers opportunities for application, problem solving and discussions, and often involves collaboration with peers.

2.4 The Flipped Classroom as a Strategy to Promote Active Learning

Active learning is defined as any teaching strategy that entails involving students in the learning process and that requires them to participate in meaningful learning activities (Prince, 2004). Furthermore, the core elements of active learning are described as student activity and engagement in the learning process as opposed to traditional methods where students are passive in receiving information from an instructor (Freeman, Eddy, & McDonough, 2014; Prince, 2004).

Similar to common practice during flipped classrooms, active learning is also closely associated with peer-teaching and case studies (Chi, 2009), interaction between students for learning (Chickering & Gamson, 1999) and learning activities that involve technology (Nelson Laird & Kuh, 2005). Lastly, active learning and flipped instruction both highly regard students' autonomy during the learning process (Hagel, Carr, & Devlin, 2012).

Studies by Freeman et al. (2014) and Kember and Leung (2005), as well as a review by Prince (2004) of the research on the effectiveness of active learning, revealed support for this type of learning. Considering the similarities between flipped instruction and active learning along with the evidence in favour of active learning strategies, the benefits of the flipped classroom as presented in Table 2.2 below seem logical and obvious.

2.5 The Benefits of Flipped Classrooms for Lecturers

Educators and researchers alike have reported the positive outcomes of a flipped approach to teaching (Hannafin, Hill & Land, 1997; Baker, 2000; Lage, Platt & Treglia, 2000; Warburton, 2003; Shea et al., 2012; Kim et al., 2014). Positive results and the potential value of student-centred learning environments where students are actively engaged and taking charge of their own learning are widely published (Hannafin et al., 1997; Kim et al., 2014; Shea et al., 2012).

The flipped classroom is one of a few models proposed to achieve this kind of student-centred learning, actively involving students in their learning (Roehl et al., 2013). O'Flaherty and Phillips (2015) who conducted a scoping review about the use of

flipped classrooms in higher education, mention that this instructional model provides a cost-effective, student-centred curricula in the face of increasing student numbers and/or limited funding.

In Table 2.2 below, the existing research about the benefits of using flipped classrooms for lecturers is tabulated.

Table 2.2. The benefits that implementation of flipped classrooms hold for lecturers

Benefit for lecturers	**References**
Once the pre-class learning activities have been designed and developed, preparation time for class on the educators' behalf has decreased.	Enfield (2013)
Recorded material (such as instructional videos) resulted in reduced need for repetitive instruction in cases where students missed class.	
The recorded material ensured the same core instruction to all students regardless of the teacher.	
Course content and material can be updated and adjusted at any time and shared with students instantly.	Fulton (2012)

2.6 Benefits for Students Participating in Flipped Classrooms

After performing a systematic review, Chen et al. (2017) found mixed results with regards to the existing evidence about knowledge and skill set gains from flipped classrooms in medical education. A study by Strayer (2012) indicated that there was no significant difference in student performance between flipped classrooms and traditional classrooms. Strayer (2012) attributes these results to the adjustments students have to make when a different educational model is implemented.

However, researchers such as Zainuddin and Halili (2016) and Berge, Nederveld, Berge and Nederveld (2015) are in agreement that the flipped classroom supports students in achieving the higher levels of Bloom's taxonomy (Krathwohl et al., 2002) by utilising class time for application and higher-order thinking, rather than merely listening to lectures or completing lower-order thinking tasks.

Studies that showed the positive impact of the flipped classroom on students' academic achievement are presented in Table 2.3 below.

Table 2.3. Studies providing evidence of the positive impact of the flipped classroom on students' academic achievement

References	Type of course	Main findings
Mason et al. (2013)	Undergraduate mechanical engineering course	Students participating in the inverted classroom performed as well or better on comparable quiz and examination questions and on open-ended design problems.
Ferreri & O'Connor (2013)	Undergraduate pharmacy course – communication, problem-solving and interpersonal skills	Students achieved significantly better academic grades.
Missildine et al. (2013)	Undergraduate nursing course – first and second year	Average examination scores were significantly higher for the students in the flipped classroom group.
Pierce & Fox (2012)	Pharmacology course – renal module	Students' performance on the final examination significantly improved compared to performance of students the previous year who completed the same module in a traditional classroom setting.
Koo et al. (2016)	Pharmacotherapy course for second-year pharmacy students	Flipped classroom improved students' test performance during the first year of implementation.

Liebert et al. (2016)	Surgery clerkship	Statistically significant improvement in mean post-test scores compared with pre-test scores across six clinical modules.
Mortensen & Nicholson (2015)	Introduction to equine science course	When compared to students in the traditional lecture format in earlier years, students in the flipped format scored higher on three examinations. Students also reported higher satisfaction regarding instructor availability to assist students; encouragement of independent, creative and critical thinking; and amount of learning during the flipped classroom as opposed to traditional format.
Galway et al. (2014)	Public health course	Students exposed to a flipped classroom model of instruction achieved examination scores similar to students from previous years who received traditional instruction, but the flipped classroom students rated their course experience more highly and reported positive learning experiences and an increase in self-perceived knowledge.
Foldnes (2016)	Not identified	Student scores on a post-test and on the final examination were significantly higher for the

		flipped classroom group than for the control group receiving traditional lectures.

Apart from the positive academic outcomes of participating in a flipped classroom model of education (Ferreri & O'Connor, 2013; Foldnes, 2016; Koo et al., 2016; Mason et al., 2013; Missildine et al., 2013; Mortensen & Nicholson, 2015; Pierce & Fox, 2012), other benefits include the fact that the recorded lecture material provides a resource to students who missed class (Enfield, 2013) and students have instant access to updated course materials (Fulton, 2012). Finally, the student-centred nature of the flipped classroom allows students flexibility in terms of their learning time, affording students opportunities to participate in other activities that would have potentially clashed with class time. During the out-of-class session of a flipped classroom, students have the freedom to complete the online activities in their own time when it suits their schedules (Herreid & Schiller, 2013).

2.7 Students' Experiences of the Flipped Classroom

Roehl et al. (2013) reported that some students participating in the flipped classroom did not adjust swiftly to the new learning environment, since it required that they do work in their own time. However, most studies in the health sciences demonstrated learner preference for flipped classrooms (Byrd-Bredbenner & Bauer, 1991; Davies et al., 2013; Herreid & Schiller, 2013; Pierce & Fox, 2012; Prober & Khan, 2013).

A study by McLaughlin et al. (2014) provided evidence that a flipped classroom (implemented during a first-year pharmaceutics course) encouraged students to explore the material and develop new skills on their own.

Students' positive inclination toward the implemented teaching strategy may play a role in their motivation to engage in the learning processes. This holds benefits for student learning since motivation is acknowledged as one of the most important educational elements underlying students' performance and achievement (Zainuddin & Halili, 2016).

2.8 The Role of Flipped Classrooms in Fostering a Deep Approach to Learning

Approaches to learning refer to the ways in which students go about their academic tasks, thereby affecting the nature of the learning outcome (Biggs, 1994 as cited in Chin and Brown, 2000). According to Biggs (1987) and Marton (1983) a deep approach to learning entails intrinsic motivation and a focus on understanding the meaning of the learning content. These authors state that students engaging in a deep approach to learning attempt to relate sections of content to each other, to new ideas and previous knowledge as well as to everyday experiences.

In contrast, a surface approach to learning is associated with memorisation of discrete facts, and the reproduction of terms and procedures by means of rote learning (Biggs, 1987; Marton, 1983). Marton and Saljo (1976 as cited in Biggs, 2012) claim that students who follow a surface approach, learn or study in anticipation of the assessment, focusing on facts and details, and rely on memorisation.

According to researchers in the fields of psychology and higher education, students' engagement in different learning activities is closely associated with the quality of their learning processes (Lucariello et al., 2016; Ten Cate, Kusurkar, & Williams, 2011; Vermunt & Verloop, 1999). Vermunt and Verloop (1999) and Short (1989 as cited in Ten Cate et al., 2011) proposed engagement in three critical types of activities for quality of learning: (a) cognitive processing; (b) affection or motivation; and (c) metacognitive regulation. In addition, Lucariello et al. (2016) identified 20 important principles for quality learning and grouped them into areas of psychological science and functioning, encapsulating cognition, motivation and social contexts, similar to the categories of learning activities identified by (Vermunt & Verloop, 1999).

In the following section, the three types of critical activities as identified above will be discussed in relation to the literature on the topic and the role that a flipped classroom can play in each.

2.8.1 Cognitive processing. Engagement in cognitive processing includes those activities that relate directly to attainment of the learning outcomes, such as memorising or structuring information, or application of knowledge (Vermunt & Verloop, 1999). Vermunt and Verloop (1999) associate cognitive learning activities with verbs such as relating, analysing, applying, memorising, critical processing, and selecting. In turn, Lucariello et al. (2016) propose that the cognitive system is rooted in the cognitive theory of constructivism.

This theory suggests that acquisition of new knowledge is affected by current knowledge and that previous knowledge will impact how students incorporate new knowledge. Carey (1986) introduced types of cognitive processes, namely *conceptual growth* and *conceptual change*.

Conceptual growth entails gaining new knowledge, or adding to existing knowledge in cases where new knowledge is consistent with the student's prior knowledge. On the other hand, revisiting or transforming current knowledge can be described as the cognitive process of conceptual change (Carey, 1986). Conceptual change occurs when existing knowledge entails conceptions that have to be overturned or modified (Lucariello et al., 2016).

Lucariello et al. (2016) is of the opinion that teachers are key role players in facilitating cognitive processing (either resulting in conceptual growth or conceptual change) by engaging students in meaningful and significant interaction with the learning content.

Although the nature of the flipped classroom model's design poses ample opportunity for teachers to achieve this, Kim et al. (2014) noted that generally most of their proposed design principles for a flipped classroom appear also to apply to a typical undergraduate face-to-face course. However, Zainuddin and Halili (2016) raised that because implementation of a flipped classroom prioritises time for problem solving and application, the higher levels of cognitive development on Bloom's taxonomy (Krathwohl et al., 2002) are naturally incorporated.

Therefore, the design and nature of the flipped classroom model ensure that teachers consider how they can create opportunities for students to utilise these more complex cognitive processes (e.g. application of concepts and stimulation of understanding), instead of only focusing on the amount of content to be covered (Carvalho & McCandless, 2014).

Since basic concepts and fundamental knowledge are addressed before class when a flipped classroom is implemented, actual contact time can be devoted to problem solving, skill development and gaining a deeper understanding of the learning content (Bergmann & Sams, 2014). In addition, Chickering and Gamson (1999) propose that during traditional formats, educators might not be aware of student progress until after assessment. The formative assessment opportunities during the class time application tasks of a flipped classroom however provide teachers with the opportunities to evaluate students' improvement and provide feedback during contact time (Kim et al., 2014).

Fulton (2012) and Herreid and Schiller (2013) are also in agreement that the interactive contact time characteristic of the flipped classroom provides insight into student learning difficulties and learning styles and as a result teachers are able to commit more time to monitoring student performance and provide feedback to help students master difficult concepts. Furthermore, the fact that students can watch or listen to the pre-recorded material as many times as they like, holds promise regarding retention of acquired knowledge (Enfield, 2013; Kim et al., 2014; Roehl et al., 2013).

The flipped classroom allows for students to allocate their time according to their individual levels of comprehension and own learning style (Fulton, 2012; Kim et al., 2014; Roehl et al., 2013). Milman (2012) speculates that the main advantage of the flipped classroom is possibly that more time is available during lectures for greater engaging instruction. Finally, Herreid and Schiller (2013) also claim that flipped classrooms pose opportunities for students to be actively involved in their learning, with promising impacts on student attainment of learning goals.

2.8.2 Affective activities and motivation. Secondly, affective learning activities engage with students' levels of motivation and are utilised when students engage in acts of self-motivation or when they are fostering certain expectations regarding their learning (Vermunt & Verloop, 1999). Zainuddin and Halili (2016) assert that in education, motivation is acknowledged as one of the most essential aspects supporting students' performance. Vermunt and Verloop (1999) associate activities in the affective or motivation dimension with acts of expectation, concentration, appraisal of and dealing with emotions. Motivation is conceptualised by psychologists as being either intrinsic or extrinsic in nature (Lucariello et al., 2016). Students who are intrinsically motivated, engage in academic activities because of the inherent fulfilment from the experience derived from the activity.

On the other hand, extrinsic motivation is at play when students engage in academic tasks in order to receive a reward (like attaining good marks) or to avoid punishment (Lin, 2007; Lucariello et al., 2016). Deci, Koestner and Ryan (1999) point out that extrinsic rewards may in fact undermine intrinsic motivation. Lucariello et al. (2016) claim that students who are intrinsically motivated do not only show improved academic achievement, but are more likely to continue to engage with tasks and activities. These authors, Lucariello et al. (2016), also assert that intrinsic motivation is closely associated with effective learning, but moreover, other authors such as Fransson (1977) and Entwistle and Tait (1990) claim that intrinsic motivation has been found to be related to a deep approach to learning.

The authors Ten Cate et al. (2011) investigated how the self-determination theory (Deci et al., 1999) can assist understanding of teaching and learning processes in medical education. In accordance with Lucariello et al. (2016) they also draw our attention to the importance of intrinsic motivation for learning by referring to the self-determination theory's three basic psychological needs for establishing intrinsic motivation (Deci et al., 1999). The three needs and the associated principles of a flipped classroom for establishing intrinsic motivation are presented in Table 2.4 below.

Table 2.4. The three basic psychological needs (Deci et al., 1999) for establishing intrinsic motivation with the associated principles of a flipped classroom

Basic psychological needs for intrinsic motivation and what the needs entail according to Ten Cate et al., (2011):	**How a flipped approach offers opportunities to address these needs:**
1. The need for autonomy: **"The desire to be one's own origin or source of behaviour"** (p. 963) Autonomy entails experiencing that behaviour is an expression of the self. It refers to the ability to decide what you want to do or to consider what would be useful to do.	Pre-class teaching and learning activities of a flipped classroom allow students to independently learn foundational concepts and encourage students to take control of their own learning (Carvalho & McCandless, 2014; Chen et al., 2017; Fulton, 2012; Kim et al., 2014; McLaughlin et al., 2014; O'Flaherty & Phillips, 2015).
2. The need for competence: **"The desire to feel effective in whatever actions one pursues and performs"** (p. 963) Competence here is not necessarily referring to attained skills or capabilities, but rather to the confidence that allows persistence when embarking on improving skills and abilities.	As opposed to traditional lecture formats where students passively receive learning content and often only get feedback on their competency after formal assessments, the contact time of the flipped classroom provides the time and opportunity for application of newly acquired knowledge and formative assessments directly after exposure to prerequisite concepts through students' interaction with the online material (Carvalho & McCandless, 2014; Chen et al., 2017; Enfield, 2013; Herreid & Schiller, 2013; Kim et al., 2014; McLaughlin et al., 2014; Milman, 2012; O'Flaherty & Phillips, 2015; Roehl et al., 2013; Zainuddin & Halili, 2016).

	By challenging students with tasks to apply their knowledge, they get the opportunity to experience success and continuously and frequently monitor their progress toward their long-term learning goals. These experiences could foster confidence and ongoing feelings of competence throughout the course, motivating students toward mastering the set competencies. This is in agreement with Lucariello et al. (2016) who claims that short-term or proximal goals, such as each time successfully applying concepts during contact time sessions, are more motivating than long-term or distal goals, such as performing well in the end-of-term examination or during the next clinical rotation. The online pre-contact time learning component of a flipped classroom, in fact, prepares students, equipping them with the theoretical basis and prerequisite knowledge required for the subsequent learning tasks during the contact time. In this way, the contact time learning takes place in the zone of proximal development[2] and grants students a fair opportunity for successful

[2] The zone of proximal development (ZPD) is described by Vygotsky (1986) as the difference between what a learner can do without any help or assistance and what he or she can do with help or support. This soviet psychologist believed that when learning goals or outcomes are in a student's zone of proximal development, they will be able to achieve them, provided that appropriate support is provided at the right time.

	application of newly acquired knowledge and feelings of competence. The option to review the online material as many times as necessary creates the opportunity for students to engage with the learning content until they feel that the outcomes were attained (Kim et al., 2014). Time is available during contact sessions to provide more individualised feedback to guide and support individual students in reaching the learning outcomes. Zainuddin and Halili (2016) claim that the flipped classroom benefitted students motivationally, and made them feel confident during learning activities in class.
3. The need for relatedness: **"The desire to feel connected with others, for caring and being cared for, having a sense of belongingness, both with significant other individuals as well as with a significant community"** (p. 963) Relatedness involves feeling connected to others, to be part of a group, in this case fellow Speech-Language and Hearing Therapy students.	The interactive and collaborative nature of the contact sessions creates a feeling of connectedness and facilitates building a learning community (Kim et al., 2014).

It is clear from the literature that the type of learning experiences offered by a flipped classroom hold potential to foster the three psychological needs for intrinsic motivation (Deci et al. 1999).

2.8.3 Metacognitive regulation. Engaging in metacognitive regulative activities is associated with quality of learning or a deep approach toward learning. According to Vermunt and Verloop (1999) these types of learning processes refer to the exertion of control over one's own cognitive and affective processes of the learning content. They proposed four types of metacognitive regulation activities which are presented in Table 2.5 below. The opportunities during flipped instruction congruent with Vermunt and Verloop's (1999) activities are presented in the last column.

Table 2.5. Vermunt and Verloop's (1999) metacognitive regulative activities and the characteristics of a flipped classroom that are congruent with these activities

Metacognitive regulative activities	**What the activities entail according to Vermunt and Verloop (1999)**	**Opportunities during flipped classrooms to engage in these activities**
1. Orientating / Planning	"Preparing a learning process by examining characteristics of the learning task, situation and assessment and thinking of possible learning goals, contents and processing activities, necessary resources, prior knowledge and available time" (p. 262)	Because the flipped classroom is a student-centred approach and encourages students to take control of their own learning (when, where and at what pace), it requires students to consider the factors for planning mentioned by Vermunt and Verloop (1999), such as available time, necessary resources, learning goals, etc. (Carvalho & McCandless, 2014; Chen et al., 2017; Fulton, 2012; Kim et al., 2014; McLaughlin et al., 2014; O'Flaherty & Phillips, 2015; Wood et al., 2001).

2. Monitoring / Diagnosing	"Monitoring means that learners actively observe whether their learning activities lead to progress in the intended direction" (p. 262) "Diagnosing refers to determining gaps in one's own knowledge, skills and mastering of the subject matter, and examining possible causes of learning difficulties or successes" (p. 263)	Engaging with learning content and utilising higher-order thinking skills during the contact time sessions of flipped classrooms, provide the opportunity for students to monitor their attainment of learning outcomes by applying what they have learned (Carvalho & McCandless, 2014; Enfield, 2013; Herreid & Schiller, 2013; Kim et al., 2014; McLaughlin et al., 2014; Milman, 2012; O'Flaherty & Phillips, 2015; Roehl et al., 2013; Zainuddin & Halili, 2016). In addition, the collaborative and interactive nature of flipped classroom activities provides opportunity for feedback from peers and the facilitator (Kim et al., 2014; McLaughlin et al., 2014; Tucker, 2012).
3. Adjustment	"Introducing changes in the original learning plan on the basis of the results of monitoring …, deciding on alternative learning activities, goals and/or contents during learning" (p. 263)	Since the flipped classroom is a student-centred approach, students have the freedom to adjust their learning processes according to their individual levels of understanding. The online material also provides the option of revisiting concepts that proved to be challenging. On the other hand, students who feel that they are making good progress and do not need the same kind of input, have the option of going faster or even skipping some of the learning tasks (Kim et al., 2014; McLaughlin et al., 2014).

		In addition, the collaborative nature of flipped classroom learning activities provides opportunities for students to find support from peers when difficulties arise (Kim et al., 2014; McLaughlin et al., 2014; Tucker, 2012).
4. Evaluating / Reflecting	"Evaluating pertains to judging the extent to which the final learning outcomes are in agreement with the goals that were planned and the degree to which the learning process has proceeded as imagined in advance" (p. 263) "Reflecting is manifested in thinking over the things that happened during the learning process and thinking about learning, teaching learning activities and learning experiences in general" (p. 263)	Once again, the interactive nature of the activities contact time component of flipped classrooms provides students with the opportunity to evaluate their progress in terms of attainment of the final learning outcomes (Kim et al., 2014; McLaughlin et al., 2014; Tucker, 2012). Roehl et al. (2013) claim that students become mindful of their own learning process during a flipped classroom as opposed to in more traditional settings. This poses opportunity for reflection on their learning. Finally, the student-centred nature and active learning strategies typical of a flipped classroom cultivate students who are deeply engaged. According to Hockings, Cooke, Yamashita, McGinty, & Bowl (2008) students who are engaged in this way, will reflect, question and evaluate ideas and learning content.

It is clear from the literature that a flipped classroom offers promising opportunities to engage students in the different types of learning activities associated with a deep approach to learning.

2.9 The Significance of a Deep Approach Toward Learning for Health Professions Education

A deep approach toward learning has particular significance in health professions education since teaching strategies resulting in conceptual change (Biggs, 2012), as opposed to the mere acquisition of information, are required to equip future health professionals as "global citizens and effective members of modern day society who can act as 'agents of social good'" (Barrie, 2012, p. 80).

Frenk et al. (2010) proposed *transformative learning*, which entails the development of health professionals as change agents that are able to participate in the transformation of health care systems. Moreover, Crisp and Chen (2014) emphasise the necessity for health professionals who are able to fulfil the different, complementary roles that they need to play in the health care system. They stated that "beyond simply producing functionaries to serve a given health care system, education also produces researchers and scientists, leaders and change agents, and health policy makers and managers" (Crisp & Chen, 2014, p. 955).

We should consider which type of education strategies will foster deep approaches to learning in order to better equip our students for the challenges of the workplace. Roehl et al. (2013) claim that the effective application of competencies such as critical thinking, communication and collaboration in the workplace, is more likely if these abilities are acquired during training. Crisp and Chen (2014) proposed that blended learning approaches, such as flipped classrooms, might facilitate the transition of learning from informative and formative toward transformative learning as Frenk et al. (2010) suggested.

Since a surface approach to learning is closely associated with students' focus on test scores and performance in assessments (Biggs, 2012), it should be considered that merely investigating students' performance during assessments as a measure of the impact of educational models such as the flipped classroom, might provide only a limited perspective on students' readiness for the workplace.

2.10 Challenges Associated with Implementation of the Flipped Classroom

The literature on the topic of flipped classrooms also makes reference to the challenges surrounding the implementation of this educational model.

Herreid and Schiller (2013) as well as Roehl et al. (2013) noted that students may be initially resistant as it may take some time to get used to the new teaching approach. Additionally, Roehl et al. (2013) were of the opinion that some students may be uncomfortable with collaborative learning activities, characteristic of a flipped classroom, as they may prefer working alone.

Furthermore, concerns were raised regarding the lack of accountability for students to complete the preparational work before the contact time (Milman, 2012; Mull, 2012 as cited in Enfield, 2013), as well as the inability to monitor students' comprehension of the pre-recorded material or answer their questions in real time (Milman, 2012).

Milman (2012) warned that it should not be assumed that all students are able to access the pre-recorded learning material on their own devices. Moreover, this author raised another important factor, namely the fact that the conditions under which students engage with the online material, may not always be optimal for learning.

Another challenge when implementing the flipped classroom for the first time, may be the time and finances required to produce the online instructional material (Enfield, 2013). In addition, effectively utilising valuable contact time for practice and application of new concepts, may bring new challenges for educators, particularly those who are accustomed to more traditional teaching models (Enfield, 2013).

Milman (2012), O'Flaherty and Phillips (2015) and Roehl et al. (2013) claimed that the flipped classroom may not be applicable to all subjects. Finally, it may not be the best educational model for students studying in their second language or students with disabilities (Milman, 2012) as more research is needed in this regard (Nwosi et al., 2016).

2.11 Conclusion

It is evident from the literature that the flipped classroom teaching strategy has definite potential. However, it is also evident that it has its own unique challenges which should be recognised and taken cognisance of. It seems as if it could have definite advantages in terms of learning for students. Therefore, by exploring the students' engagement in cognitive processing, affective activities and metacognitive regulation, the proposed study aims to investigate how a flipped classroom influenced the learning approaches of first-year Speech-Language and Hearing Therapy students.

Chapter 3: Methodology

3.1 Introduction

The current study aimed to address the research question: *How would a flipped classroom influence the learning approaches of first-year Speech-Language and Hearing Therapy students?* The main aim of the study was to explore the influence of a flipped classroom on the participants' approaches toward learning. This was done through investigating their engagement in activities of cognition, metacognition and intrinsic motivation during flipped classrooms as these were identified by Vermunt and Verloop (1999) as crucial activities for quality of learning.

This chapter will report on the research design, instruments, sampling of participants, data collection and analysis. The chapter will conclude with a discussion of the study's trustworthiness and ethical considerations.

3.2 Research Design

A qualitative, descriptive research design (Sandelowski, 2000) was used to measure the influence of the flipped classroom on the participants' approaches toward learning. This design was selected to allow for rich descriptions of students' activities during flipped instruction. Furthermore, in order to answer the research question successfully, it was necessary to choose a design that would allow the participants to "speak in their own voice" (Sofaer, 1999, p.1105) to gain insight into the approaches they followed during the flipped classroom.

3.3 Research Instruments

3.3.1 Flipped classrooms. Following the nine principles from Kim et al. (2014), the researcher designed a series of four flipped classrooms for the purpose of the study. The nine principles are presented in Figure 3.1.

Design Principles

- Provide an opportunity for students to gain first exposure prior to class
- Provide an incentive for students to prepare for class
- Provide a mechanism to assess student understanding
- Provide clear connections between in-class and out-of-class activity
- Provide clearly defined and well-structured guidance
- Provide enough time for students to carry out the assignments
- Provide facilitation for building a learning community
- Provide prompt/adaptive feedback on individual or group works
- Provide technologies familiar and easy to access

Figure 3.1. Nine design principles for flipped classrooms (Kim et al., 2014)

Appendix A provides more information on how these nine design principles were incorporated into the design of the flipped classrooms that were implemented for this study.

As proposed by Milman (2012), the flipped classrooms in this study were employed mainly for teaching procedural knowledge (described by Krathwohl et al. [2002] as knowledge about *how to do something*). However, other types of knowledge (factual, conceptual and metacognitive) as presented by Bloom's taxonomy (Krathwohl et al., 2002) were also targeted, although only to a limited extent.

Refer to Appendix B for a QR code to view one of the podcasts employed as pre-class teaching material during one of the flipped classrooms.

3.3.2 Introductory podcast. Realising that the flipped classroom was most likely a new experience for students, and following the example of McLaughlin et al. (2014), the researcher made an introduction podcast to ease students' transition to this new way of learning. The podcast provided a motivation for the redesign of the module, and a detailed description of the course. The podcast also communicated the expectation that the students would engage with the online material prior to each contact session in order to benefit from the in-class learning tasks.

3.3.3 Discussion guide. The researcher developed a discussion guide for the focus groups to explore the participants' engagement in cognitive processing, affective activities (motivation) and metacognitive regulation as evidence of deep approaches to learning (Lucariello et al., 2016; Vermunt & Verloop, 1999). The discussion guide contained an open-ended introductory question for and relating to each of the critical types of learning activities (cognitive, affective and metacognitive regulative) associated with a deep approach to learning. In addition to the respective introductory questions, associated and more specific prompts were indicated for each type of activity.

This design of the discussion guide is in accordance with Stewart and Shamdasani's (1990) principle for preparation of interview schedules, namely that questions should move from general to more specific. Refer to Appendix C for the discussion guide that was consulted during the focus group discussions. The discussion guide was compiled to prompt participants for reference to engagement in cognitive processing, affective activities and metacognitive regulation during their exposure to the flipped classrooms.

3.4 Data

3.4.1 Participants. The study population consisted of 2 male and 22 female first-year Speech-Language and Hearing Therapy students registered at the time of this study for the module Articulation and Phonological Disorders at a university in the Western Cape, South Africa. The participants' chronological ages ranged between 18 and 21 years. The diversity profile of the study population is presented in Table 3.1 below:

Table 3.1. The diversity profile of the study population

	African	**Coloured**	**Indian**	**White**
Number of participants	3	11	0	8

3.4.2 Sampling. Purposive sampling (Patton, 2002 as cited in Palinkas et al., 2015) was utilised to deliberately select the participants to ensure that the sample covers the possible characteristics of interest. This type of sampling entails a non-random way of ensuring that participants with important perspectives on the phenomenon in question are included in the sample (Trost, 1986). In this case the students in the first-year class of a Baccalaureus of Speech-Language and Hearing Therapy programme were purposefully selected to participate. These students were registered for the module Articulation and Phonological Disorders at the time of the study.

3.4.3 Selection criteria. All students in their first year of study in the programme Baccalaureus of Speech-Language and Hearing Therapy at the relevant university and who had met the inclusion criteria, were invited to participate in the study.

The study only included participants who:

- provided written consent to take part in the study.
- were registered for the relevant module for the first time (in other words students who were repeating the module were not included in the sample).
- participated in all four the flipped classrooms that provided the context for this study. This was monitored by having the students who attended the contact sessions sign an attendance list and by reviewing the activity logs on the learning management system where the learning resources for the pre-class activities were hosted).

3.5 Research Procedures

3.5.1 Implementation of the flipped classrooms. Four flipped classrooms were presented, each consisting of two teaching and learning sessions (eight sessions in total). Each of the flipped classrooms comprised a preparation session where students were required to study podcasts and participate in interactive lessons online in their own time, with a subsequent contact session where the students worked through problems and advanced concepts, applied their knowledge and engaged in collaborative learning, all facilitated by the lecturer. The online lessons were developed by utilising the software iSpring Solutions and hosted on the university's online learning management system.

The flipped classrooms were presented over the course of a four-week period. The online pre-class components of the flipped lectures were each available for seven days prior to the associated contact sessions, as well as after that for the rest of the duration of the course. In accordance with the notion that flipped classrooms usually entail that students interact with technology for learning (Kim et al., 2014; O'Flaherty & Phillips, 2015; Zainuddin & Halili, 2016), inverted instruction during this study also utilised a blended learning approach to teaching. Blended learning is described by Garrison and Kanuka (2004) as "thoughtful integration of classroom face-to-face learning experiences with online learning experiences" (p. 96). The pre-class learning sessions were hosted online and contained links to internet resources and videos. Additionally, during the contact time, the online classroom application Socrative was employed to stimulate engagement and interaction in class.

3.5.2 Data collection. Within one week of the last contact session of the series of four flipped classrooms, the data collection was conducted. Qualitative data was gathered by means of three focus groups. According to Kitzinger (1994) the interaction during focus groups is utilised as part of the method. Participants were hereby encouraged to talk to each other (Kitzinger, 1994). People are often stimulated by a discussion in a focus group and reveal facts and opinions that they otherwise might not have chosen to reveal. In addition, focus groups provide the opportunity to clarify attitudes and beliefs (Skinner, 2014).

The focus groups consisted of eight participants each and were facilitated in a neutral environment. The duration of the focus groups was approximately 40 minutes each

and the data collection was conducted by a research assistant who has experience in this method of data collection. The researcher was not involved with or present during the focus group discussions in an attempt to eliminate the potential influence of a power relationship that could exist between the researcher (as lecturer) and the participants (as students).

The discussions during the focus groups were audio-recorded and the research assistant also took notes. Unfortunately, the recording of one of the focus groups initially failed and consequently ten minutes of the discussion were not recorded. The focus group facilitator provided information about the discussion during the interrupted section of the recording by means of his field notes, taken during the focus group.

3.5.3 Preparation of the data. Subsequent to the execution of the focus groups, the data was transcribed and anonymised during transcription. The audio recordings were destroyed after transcription.

3.6 Data analysis

The raw data consisted of field notes and audio recordings of the focus group discussions. This data was prepared for analysis through verbatim transcription of the audio recordings by another research assistant. All transcriptions were subsequently checked by the researcher as a quality measure but also a means to engage with the data.

Saldana's (2009) codes-to-theory model for qualitative inquiry was utilised by the researcher to analyse the data. This method entailed coding the data by assigning “a summative, salient, essence-capturing attribute to a portion of the language-based data” (Saldana, 2009, p. 3). Subsequently, the various codes were categorised, following a process of arranging the data in a systematic order, allocating the codes to be part of a system and classifying the codes into categories. Finally the categories’ codes were clustered into three major themes. Figure 3.2 below represents Saldana's (2009) streamlined codes-to-theory model for qualitative inquiry.

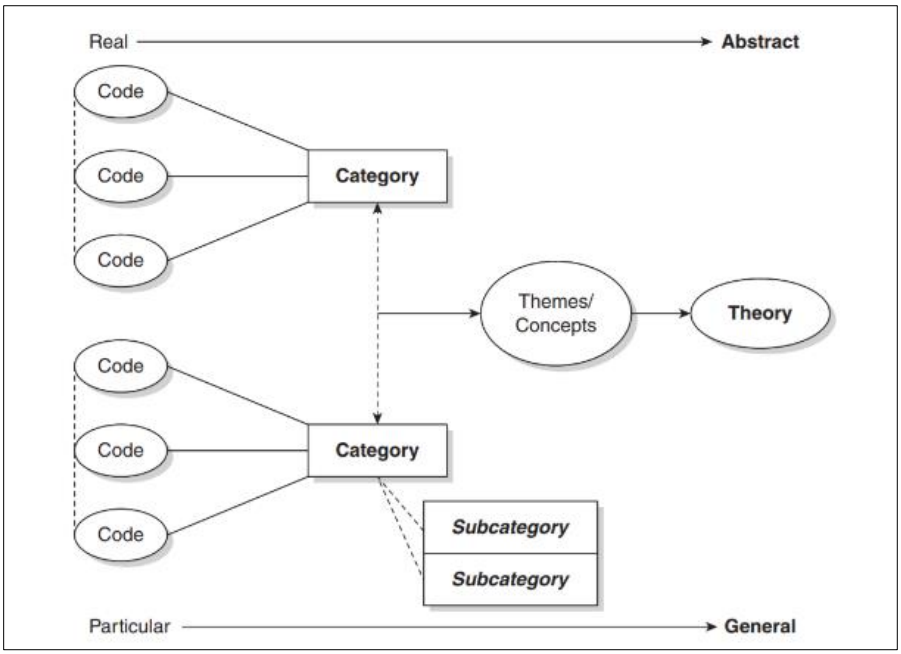

Figure 3.2. Saldana's (2009) codes-to-theory model for qualitative inquiry

3.7 Trustworthiness

The researcher employed the following strategies to ensure rigour and trustworthiness of the study:

Firstly, credibility was enhanced by conducting the focus groups in a neutral, natural environment and having a research assistant, not the researcher (the lecturer), facilitate the discussions in order to elicit more discussion and encourage the participants to share freely.

Secondly, transferability was improved by providing thick descriptions (Frambach, Vleuten & Durning, 2013) of the findings and the context of the study. In addition, the sampling strategy was explained and findings compared to existing literature in this final report of the study, thereby also enhancing the confirmability of the findings. Confirmability was improved further through the process of reflection whereby the researcher reflected on her potential influence on the findings. Lastly, the process and findings of the study were discussed with experts in qualitative methods and health professions education.

3.8 Ethical Considerations

The study was approved by the relevant university's ethics committee, prior to commencement of the research procedures (ethics reference number: S17/03/052). In addition, permission was obtained from the programme committee of the Baccalaureus of Speech-Language and Hearing Therapy, as well as the university's Division of Institutional Planning prior to commencement of the study.

After receiving ethical clearance, the potential participants were approached and provided with an informed consent form (refer to Appendix D) describing all of the study procedures, including the nature, and the perceived benefits and risks, of the study. Participants were informed that participation is voluntary and that refusal to take part in the study, or withdrawal from the study, would not have any negative repercussions. Explicit attention was paid in this regard since a possible power relationship could exist as the researcher was the participants' lecturer at the time.

During the focus group discussions, participants were allowed to communicate in their preferred language. There was no need for an interpreter. Letters were randomly assigned to the participants as identification and their names and personal identifying information were not used during the data analysis process, or in this written research report. Furthermore no identifying information about the participants will be used in a submission for publication in an academic journal or in a presentation of the topic at an academic conference or for any other audience. The data is stored on a password-protected computer and data on hard copy is locked away in an office.

The results of the study will be made available to the programme committee of Baccalaureus of Speech-Language and Hearing Therapy, as well as to the participants in a summary report. In addition, the researcher aims to publish and present the results at conferences, without including any identifying information to protect the participants.

Chapter 4: Results and Discussion

4.1 Introduction

This study explored students' engagement in cognitive processing, affective activities and regulative metacognition during their exposure to flipped classrooms.

The data from the focus group discussions and field notes was coded. The different codes were grouped into categories that described the characteristics or enabling attributes of the flipped classroom that Speech-Language and Hearing Therapy students' expressed as the reasons for engaging in the three types of activities associated with a deep approach to learning. The three types of activities (as described in Chapter 3) are cognitive processing, motivation and metacognitive regulation. These three types of activities were labelled as the three main themes for the purpose of reporting the results.The main themes and categories are presented in Table 4.1 below.

Table 4**.1**. The main themes and categories from the results

Theme 1: Cognitive Processing	**Theme 2: Motivation**	**Theme 3: Metacognitive Regulation**
• Addressing the individual student's cognitive needs	• Control over own learning process	• Pre-class learning in preparation of contact time
• Pre-learning sessions	• Opportunities to experience success	• Opportunities for feedback
• Opportunities to practice	• Relevance of learning activities for career	• New learning experience
• Access to feedback	• Community for learning	

The results will be thematically described and discussed in the following sections of this chapter by also referring to the different categories of each theme. Direct quotes as found in the transcripts will be used to illustrate the results and will be referred to in the following way: FG (Focus Group) and F (specific participant in the focus group).

4.2 Theme 1: Cognitive Processing

The following categories were created from the different codes that were found during the data-analysis process:

Category 1: Addressing the individual students' cognitive needs

Category 2: Pre-learning sessions

Category 3: Opportunities for practice

Category 4: Access to feedback

4.2.1 Category 1: Addressing the individual student's cognitive needs.

The participants welcomed the fact that they could control their learning environment and pace. They mentioned learning in a lecture hall could impose distractions and be uncomfortable, which could impede on the attainment of their learning goals. This quote by a participant during a focus group discussion, illustrated this point:

Like you're not squashed with people. People aren't making a noise … It's like there is distraction around you. I am personally a person that loves to concentrate when everything is quiet. Like I can't have music, I can't have people talking. So, if you retain information best in silence, then I prefer being at home. [FG2F5]

Participants were also very positive about the fact that they could adapt the duration of their learning sessions according to their individual concentration levels. In addition, the participants recognised the learning potential of having ongoing access to the lectures online, offering the opportunity to revisit challenging concepts:

So, I mean it is perfect in that sense. So if you haven't grasped something completely, you can relearn and relearn until you have really, really grasped it. [FG1F4]

The participants also stated that having control over the pace of learning, addressed their individual levels of comprehension which promoted attaining the learning outcomes.

4.2.2 Category 2: Pre-learning sessions. The students were positive about the fact that the learning during class time built upon the pre-learning that occurred in their own time. They also articulated that by completing the pre-class learning session, they were able to engage critically and benefit optimally from the contact time activities.

The following quote indicates the importance of pre-learning for deep understanding and consolidation of the learning process:

I think that after listening to the podcast, when we go to class, that always actually like consolidates whatever work we did do in the podcast. [FG2M6]

One participant raised how she experienced conceptual change during contact time, following her conceptions during the pre-class session:

If I were to do a speech screening [in class], *then what I learnt* [in the pre-learning session] – *Was this wrong with mine? – and I would do this next time.* [FG1F7]

4.2.3 Category 3: Opportunities for practice. The participants were very positive about the benefits for learning when having the opportunity to apply new knowledge like they did during the contact time sessions of the flipped classrooms. They felt that having the opportunity to practise in class also promoted deeper understanding, as illustrated by the following quote:

What I like most about the flipped classroom is that you get to practise what you learnt the previous evening. So it's nice, when you do something physically, then you understand it better. [FG1F1]

They articulated that by doing something practically, such as the application of skills during the contact time sessions, their learning was promoted or improved. In addition, the fact that they were actively involved, engaging with the learning material, supported their ability to focus and learn. These opportunities were highlighted as one of the main reasons for the flipped classroom's success. The following quotes from the focus groups illustrated it:

So I think the fact that you're actually doing something, even if it's something really small, that you take in that information. [FG2F6]

The whole point of this module is the practicality point, and I think that that's also why it's so effective, the flipped classroom approach. [FG2F7]

4.2.4 Category 4: Access to feedback. The participants appreciated the opportunities that the interactive nature of flipped classrooms offered for ongoing feedback. The fact that they had access to instant feedback while practising skills and applying knowledge, was perceived to have improved their competence, as illustrated by the following quote:

… in this example I'd learnt it, come to class, practise it and then get help and feedback immediately instead of at some other disjointed time. [FG1F5]

The interactive nature of the in-class learning activities also seemed to hold positive outcomes for the participants. They mentioned that they not only benefitted from the feedback from the lecturer, but from their peers as well. They felt that receiving feedback from peers offered alternative perspectives to their own, and that they found that they could learn from that.

Usually it's groups of two or three, small groups, and then you discuss with your fellow students. So then it's nice to hear how they see it and how they understand it. So I think you get a lot more, or a lot of different perspectives, whereas in a lecture you usually get one. [FG1F1]

4.2.5 Discussion of the results of Theme 1: Cognitive processing during flipped classrooms. The participants' feedback that the flipped classrooms contributed to better learning, is supported by evidence in the literature regarding increased student performance after flipped classrooms (Baepler, Walker, & Driessen, 2014; Byrd-Bredbenner & Bauer, 1991; Day & Foley, 2006; Ferreri & O'Connor, 2013; Mason et al., 2013; McLaughlin et al., 2013; Missildine et al., 2013; Moravec, Williams, Aguilar-Roca, & O'Dowd, 2010; Pierce & Fox, 2012).

The results revealed that students experienced conceptual change during the flipped classrooms, and are in accordance with Biggs (1999) who claimed that conceptual change is likely to take place when students experience the freedom to focus on the task as well as have clarity about the practical value of the knowledge to be acquired (i.e. what they will use it for).

The participants' expressions about the value for better attainment of learning outcomes after the opportunities to be actively and interactively engaged with learning content, as opposed to passively listening to lectures, are also supported by Kim et al. (2014).

The participants of the current study alluded to the benefits of the ongoing feedback during the flipped classrooms. These results are in accordance with findings of Fulton (2012) and Herreid and Schiller (2013). Biggs (1999) also claims that good dialogue, both with peers and teachers, promotes activities that shape, expand and deepen understanding. Lucariello et al. (2016) are in agreement that student learning is increased when they receive regular and timely feedback about their work.

The participants' claims about the value of practice in acquiring new knowledge and skills are supported by Berge et al. (2015) and Zainuddin and Halili (2016). These researchers raised the point that while the pre-class learning during flipped classrooms facilitates remembering and understanding as the lowest levels of the cognitive domain (Krathwohl et al., 2002), the interactive nature of the in-class sessions promotes the higher levels of Bloom's taxonomy (Krathwohl et al., 2002), namely application, analysis, evaluation and creating. In addition, the literature identifies deliberate practice as key for the transfer of information from one's short-term to long-term memory (Lucariello et al., 2016) adding significance to the current study's results in this regard.

The positive feedback during the focus groups, that the learning activities during the contact time consolidated their knowledge from the pre-class sessions, strongly reminds of the cognitive theory of *constructivism* which proposes that the acquisition and assimilation of new knowledge are affected by current knowledge (Lucariello et al., 2016). The participants' claims that the pre-class learning prepared them to benefit optimally from the learning activities during the contact time, suggest that the pre-learning served to position the higher levels of the cognitive domain that were required for the contact time tasks, within the students' zones of proximal development (Vygotsky, 1986), thereby making these more advanced cognitive processing attainable. It is however important to note Herreid and Schiller's (2013) concern that the pre-class learning activities need to be carefully tailored in order to achieve this.

Lastly, the self-determination theory by Deci et al. (1999) suggests in accordance with this study's results, that by not allowing students the option to choose how to learn, they are less likely to identify with the material resulting in a lack of integration of the material into their identity as future professionals (Ten Cate et al., 2011).

4.3 Theme 2: Motivation

The following categories were created from the different codes that were found during the data-analysis process:

Category 1: Control over own learning process

Category 2: Opportunities to experience success

Category 3: Relevance of learning activities for career

Category 4: Community for learning

4.3.1 Category 1: Control over own learning process. Although some participants articulated that they were initially resistant to a new way of learning, they indicated that in retrospect the flexibility offered by flipped classrooms encouraged them to engage with the learning activities. They claimed that having control over their learning encouraged them to complete the tasks. They valued the self-paced nature of the pre-class sessions and felt that the flexibility regarding the learning space and time also motivated them to pay better attention and learn.

What I like about the flipped classroom is that the learning is on you. So it's up to you to go to the podcasts and do it and like to understand what happens in class. [FG1F1]

It's hard for me, I struggle to focus in that environment, and then a lot of the times I'm just thinking about when can this lecture please finish. But with this way, I can sit at home, I can open all the windows I want, I can stop, make some tea, I can take a ten-minute break, and then I can go back to the work. [FG1F5]

4.3.2 Category 2: Opportunities to experience success. The participants were enthusiastic about having the opportunities during the contact time sessions of the flipped classroom to apply what they have learnt. They articulated that both the quizzes at the start of each class as well as the application tasks created within them feelings of confidence, which in turn motivated them to complete the pre-class tasks in preparation of the contact time, as illustrated by the following quote from the focus groups:

You're like yay, I got it right, and then you know that you know the work. It like boosts your confidence, it motivates you, and you know you know your work already. [FG3F2]

One participant mentioned that she appreciated the opportunity to feel that she is able to do it before she had to work with real patients:

So it's been great because now I can see okay well, well I definitely would prefer to practise with a peer than have my first time doing say speech screening or like one for example with a child who actually needs speech therapy. So it's a great time to practise it now, and it's an opportunity to practise it now, versus going and completely not knowing what to expect. [FG1F5]

In addition, the fact that students could access recorded material as many times as they like, made them feel in control and better prepared for application of the new knowledge. They expressed that this advantage offered by the flipped classroom, made learning less stressful and manageable.

The greatest thing about the flipped classroom, is that even if you haven't grasped everything properly now, you can go back and listen to the full lecture with her explaining everything in detail. So it's a lot less stressful in the sense that if you feel like you have missed something or you're not entirely sure of a concept, you can go back and relearn the whole thing as many times as you like. [FG1F4]

4.3.3 Category 3: Relevance of learning activities for career. The participants expressed their excitement about the engagement, during the flipped classrooms, with learning content that seemed directly related to the profession that they are pursuing. They welcomed the fact that the contact time did not merely offer additional theory. They felt that since the flipped classrooms prioritised time for practising skills and applying knowledge, it provided them with opportunities to engage with the skills that they will ultimately be using as working therapists. They said that this motivated them to engage with the content, since it was relevant, and mastering it would benefit them in their future careers. This notion was common across all three focus groups. Below is an example of one of the quotes from the first focus group:

It's very motivational in that sense because you know that all this work is going to be so useful as a speech therapist. It's not just theory that's being thrown at you. It's very practical, and you can actually see how it's going to be applied later. [FG1F4]

4.3.4 Category 4: Community for learning. The participants were positive about the collaborative nature of the flipped classrooms. They alluded that working with peers during the in-class learning activities made them feel part of the class and that it was a positive experience working together on actual clinical tasks. It was as if this collaboration fostered the realisation that all of them were aspiring to become speech therapists. One of the participants expressed that although the individualised nature of the pre-class sessions were largely welcomed, she valued the fact that not all of the learning tasks were designed that way. The other participants agreed that the individualised nature of the pre-class sessions together with the collaborative learning opportunities offered during the contact time provided a well-balanced learning experience.

In addition, one participant mentioned that it motivated her to learn the information because she felt like the lecturer desired for them to become competent speech therapists. She expressed this feeling of being cared for through the following quote:

But you can see with [the lecturer]*, like she actually wants to make you learn, and she wants to help you use this information practically. So you go home, you learn the information.* [FG2F7]

4.3.5 Discussion of the results of Theme 2: Motivation during flipped classrooms. The participants' perceptions of having control over their learning, the experiences of success during the contact time, the feelings of being engaged in activities relevant for their future careers and forming part of a community of learning, are consistent with the innate needs for intrinsic motivation as identified by Deci et al. (1999). This is in accordance with evidence from Zainuddin and Halili's (2016) study which concluded that a flipped classroom approach is likely to address students' needs for autonomy, relatedness and competence.

The feelings expressed by the participants of being in control of their own learning processes during the flipped classroom, speak to the need for autonomy (Deci et al., 1999). Participants' reports about increased motivation as a result of having control over learning resources, time, study space and pace, are in accordance with other research, for example Wigfield, Eccles and Rodriguez's (1998) findings that students' abilities to self-regulate their learning are associated with shifts from extrinsic to intrinsic motivation. O'Flaherty and Phillips (2015) concluded that the completion of preparatory work allows students to be more interactive during actual class time and that in turn fostered student ownership of learning.

Reeve (2012, as cited in Ten Cate et al., 2011) also claimed that students benefit when teachers support their autonomy. Moreover, results from McLaughlin et al. (2013) show that the flipped classroom in their study also encouraged students to explore materials and develop new skills on their own – evidence that they were intrinsically motivated to learn more about the subject.

Learning perceived as participation in a community of practice is described in the literature by Rogoff (2003). The perceptions of the participants in the current study that the flipped classroom offered them a community for learning, addressed the innate need for relatedness as expressed by Deci et al. (1999). This is in accordance with studies by McLaughlin et al. (2013) and (Kim et al., 2014) who claimed that the in-class discussions during their flipped classrooms also facilitated feelings of relatedness among students and enabled students to build a community to share ideas and problem solve. Kim et al. (2014) and Littlewood et al. (2005) support participation in a professional community as a means to stimulate feelings of relatedness. The perception of the participants in the current study, that the lecturer wanted them to

succeed, contributed to feelings of connectedness and being cared for which according to Deci et al. (1999) satisfy the innate need for relatedness.

It is important to note that Littlewood et al. (2005) and Kim et al. (2014) emphasise the benefits when such a community of learning is created early in students' curriculum, which was the case in the current study as students in their first year of study were participating.

However, Kim and colleagues' (2014) reference to the key role of the teacher as facilitator of positive communities and fostering a culture of collaborative learning, should be noted. The participants in the current study's expressions of relatedness as presented in the results, prove that the teacher in this case was successful in achieving this.

According to the participants, the need for feelings of competence as a contributor to intrinsic motivation (Deci et al., 1999) was also satisfied, particularly during the contact time components of the flipped classroom. The application tasks and quizzes offered opportunities to achieve success in terms of their learning goals, creating feelings of confidence. These results are in accordance with literature. Enfield (2013) states that the flipped classroom increases self-perceived knowledge and that the use of quizzes appeared to be a strong motivator for students to engage with the online material. Chen et al. (2017) also found that in-class quizzes served as motivation for in-class participation. This is also in accordance with McLaughlin et al. (2013) who claimed that engaging students in active learning, such as class discussions and case studies, promotes their confidence in their ability to apply knowledge, which in turn increases their motivation.

The participants in this study also mentioned that the nature of the tasks during the contact time gave them glimpses of their future careers as therapists, which motivated them to prepare for these tasks through the pre-class learning sessions. This is probably the result of the focus on procedural knowledge (Krathwohl et al., 2002) during the flipped classrooms, as this recommendation by Milman (2012) was implemented when the flipped classrooms were designed. The participants in the current study were as a result exposed to application of clinical skills that speech-language therapists utilise in practice.

The participants' motivation resulting from the relevance of the learning tasks, reminds of the role that mastery goals, as opposed to performance goals, can play in students' motivation to learn (Lucariello et al., 2016). Ames and Archer (1987) described mastery goals as goals to develop competence as opposed to performance goals that entail that students merely aim to demonstrate ability. Ames and Archer (1987) also pointed out that when students adopt mastery goals, they are likely to persevere during challenging tasks and report to being intrinsically motivated. This is consistent with the current study's participants' feedback during the focus groups.

The notion of students being initially reluctant when confronted with the flipped classroom as a new educational model, is in accordance with Herreid and Schiller (2013) and Hutchings and Quinney (2015). Herreid and Schiller (2013) attributed this resistance to students' reluctance to work at home as opposed to receiving learning content in class.

Hutchings and Quinney (2015) proposed strategies for effective change management to minimise risk factors for disruption when flipped classrooms are employed. These authors acknowledge the significance of individual, cultural and strategic shifts as prerequisites for generating and sustaining change. They emphasise the importance of establishing a shared vision with students about the new learning strategy and outcomes, as well as the critical role of soft skills (such as active listening and timely communication) on the lecturer's behalf in order to build student confidence, academic partnerships, and to facilitate resilience in the face of barriers to change (Hutchings & Quinney, 2015).

4.4 Theme 3: Metacognitive Regulation

The following categories were created from the different codes that were found during the data-analysis process:

Category 1: Pre-class learning in preparation of contact time

Category 2: Opportunities for feedback

Category 3: New learning experience

4.4.1 Category 1: Pre-class learning in preparation of contact time. The participants reported that they utilised the pre-class sessions to prepare for the contact time, and considered which aspects of the work they might need help with. They also felt that the pre-class content promoted an awareness of the learning goals informing their learning strategies, as the podcasts outlined the learning outcomes and addressed how the content will be applied in the contact session to follow:

So I know okay, when I come to class, I need to know what articulation is, I need to know what phonology is, because that's the only way I'm going to be able to do the practical side of what we cover today. [FG1F5]

This quote by a participant illustrated how the pre-class learning encouraged metacognition:

It [the pre-class learning] *also helps me, I've realised, to ask more informed questions, instead of going to the lecturer and saying, what is articulation. You start asking, I understand that articulation goes with this and this and that, and I have read that articulation is this, so what about this? Would this not be considered this, instead of asking blank statements.* [FG3F1]

4.4.2 Category 2: Opportunities for feedback. As a whole, the participants were confident that the quiz at the start of each contact session as well as the interactive application tasks provided them with an indication of their progress and attainment of their learning goals. This was illustrated by the following quote from a participant:

So when I got to the quiz, or when I got to the practical side, I didn't know that much of what was going on, and that's when I realised that this is something that I need to work on. [FG2F4]

Furthermore, the participants felt that since the contact time was not demarcated to cover large amounts of theory, it provided the space and time for them to ask questions that emerged during their pre-class learning.

In addition, they valued the real-time feedback at each contact session, as illustrated by this quote from the first focus group:

Then I know immediately … which is great, because there's time to ask questions and there's time to double check. [FG1F5]

Thus instant feedback promoted reflection about their learning strategies and enabled opportunities to make adjustments in their learning in order to improve success in the next contact session.

The participants across the three focus groups were positive about the fact that through the application tasks during the contact time, they were able to identify problem areas or aspects on which they needed to improve or obtain additional input.

4.4.3 Category 3: New learning experience. It was evident from the focus group discussions that being exposed to a different model of teaching fostered reflection about how flexibility regarding the time and place of learning impacted them. In addition, the interactive nature of the contact time offered a type of experience different to that of their other lectures. Participants claimed that as a result, the group work during class promoted discussions with peers about their progress as opposed to the one-directional nature of traditional lectures. The fact that the flipped classroom model introduced the participants to a different and new way of learning, therefore encouraged reflection about teaching and learning in general.

4.4.4 Discussion of the results of Theme 3: Metacognitive regulation during flipped classrooms. The results of the current study suggest that the flipped classrooms facilitated the participants' engagement in regulative learning activities as described by Vermunt and Verloop (1999).

The participants' feedback about the role of the pre-class sessions in preparation of their learning during contact time alludes to Vermunt and Verloop's (1999) categorisation of orienting/planning as a metacognitive activity. In addition, the participants' positive responses to the ongoing feedback during the flipped classroom, that they felt it enabled them to monitor their progress, identify gaps in their knowledge, and find ways to address challenging aspects, speak to the regulative category of monitoring, testing and diagnosing (Vermunt & Verloop, 1999). The fact that the participants reflected on the impact of a different teaching model on how learning time is utilised, proved that the exposure to the flipped classroom as a novel learning experience promoted their engagement in the evaluative and reflective activities that Vermunt and Verloop (1999) described as "thinking about learning, teaching … and learning experiences in general" (p. 263).

These results are in accordance with findings from a study by Çakıroğlu and Öztürk (2017). These researchers investigated whether problem-based learning promoted self-regulation during flipped classrooms. They found in accordance with the current study's results that their students exercised the metacognitive activities of planning for learning and setting of learning goals and applied adjustment by seeking help with topics that they found challenging. Finally the students in their study also utilised opportunities during the flipped classroom to evaluate their progress.

4.5 Conclusion

After investigating the types of activities that the participants engaged with during the flipped classes in this study, evidence was found that a flipped classroom model of instruction did provide opportunities for the participants to engage with the activities associated with a deep approach toward learning.

Chapter 5: Conclusion

5.1 Introduction

Students base their approaches to learning on their perceptions of the educational practices and assessments that they are exposed to (Ramsden et al., 1988). The significance of selected educational models is therefore not to be underestimated by lecturers and educators in higher education. This study explored the influence of a flipped classroom on first-year Speech-Language and Hearing Therapy students' approaches toward learning through the qualitative analysis of focus group discussions about their learning experiences.

In contrast to previous studies that examined the outcomes of flipped classrooms by measuring students' academic performance and/or conducting surveys about students' perceptions and attitudes, the current study investigated the types of activities students engaged with during the flipped classes as evidence for a deep approach toward learning. In addition, since no studies could be found where the flipped classroom was employed in training students in speech-language and hearing therapy, the current study wanted to contribute to a more diverse set of discipline-specific evidence.

This chapter summarises the findings, identifies the strengths and discusses the limitations of this study. Finally, recommendations for further research will be outlined.

5.2 Summary of Findings

The results showed that the flipped classroom provides a promising teaching approach, particularly when the intent is to facilitate students' engagement in higher levels of cognitive thinking, foster intrinsic motivation and encourage metacognitive activity during their learning processes. Reasons discussed include that the nature of a flipped classroom provides for ample opportunities to facilitate conceptual growth and conceptual change. In addition, the model encourages autonomy of the learning process, provides learning experiences that foster feelings of confidence and competence and offers a learning community that students can relate to. Finally, being exposed to a different educational model where students are active participants in learning, facilitates metacognitive processes where students reflect on their own learning and learning in general.

These experiences are characteristic of the different types of learning activities that are closely associated with the quality of their learning processes and a deep approach to learning (Vermunt & Verloop, 1999).

As a whole these results are in accordance with other researchers' conclusions about the flipped classroom, indicating that this teaching model generally enhances students' learning (McLaughlin et al., 2014). Moreover, the results reaffirmed the notion held by scholars in teaching and learning that students are more likely to engage in activities of learning in inviting learning environments and when they are challenged with higher-order thinking tasks, but with support from educators and opportunities to confirm and adapt their knowledge (Bryson & Hand, 2007; Carvalho & West, 2011).

5.3 Strengths and Limitations

The results of this study add to the existing literature on effective instructional models in health professions education. Since the flipped classroom is becoming more commonly implemented in health professions education, this study also provides guidance to educators in utilising this educational model to promote a deep approach toward learning. Finally, the study emphasises the importance of instructional design and the crucial role of learning experiences when preparing students for their future careers.

Since students take some time to adjust to a new system of learning (Roehl et al., 2013), longer exposure to the flipped classroom model may provide more valid conclusions about the impact on students' approaches to learning. In addition, detailed information about the quality of participants' engagement with the online learning material, such as how long they spent on each activity, how many times they accessed particular topics, did they pause at specific points or did they go back to previous slides, etc. would inform conclusions about the role of the pre-class learning sessions.

Finally, it should be acknowledged that a change in the usual procedures can produce changes in students' behaviour, known as the Hawthorne effect (O'Flaherty & Phillips, 2015). The possibility therefore exists that the participants' engagement in the different types of learning activities associated with deep approaches to learning, was as a result of the fact that a different teaching strategy was used, and not necessarily or specifically as a result of the flipped classroom that was implemented.

5.4 Recommendations for Future Research

O'Flaherty and Phillips (2015) found that there is little evidence that reflects the long-term improved educational outcomes of flipped classrooms as opposed to traditional teaching practices. It is recommended that flipped classrooms should be implemented and the impact investigated against consecutive offerings, for example throughout an entire study year or programme. Evidence regarding the value of the flipped classrooms to teach different types of knowledge, namely factual, conceptual, procedural and metacognitive (Krathwohl et al., 2002) will inform which courses would benefit from implementing this educational model. Finally, in accordance with Kim et al. (2014), it is recommended that the flipped classroom is implemented and investigated in more disciplines to provide a more robust set of evidence regarding this model's value for teaching and learning.

Reference List

Ames, C., & Archer, J. (1987). Mothers' beliefs about the role of ability and effort in school learning. *Journal of Educational Psychology*, *79*(4), 409–414. https://doi.org/0022-0663/87/$00 75

Baepler, P., Walker, J. D., & Driessen, M. (2014). It's not about seat time: Blending, flipping, and efficiency in active learning classrooms. *Computers and Education*, *78*, 227–236. https://doi.org/10.1016/j.compedu.2014.06.006

Baker, J. W. (2000, April). *The "classroom flip": Using web course management tools to become the guide by the side*. In Selected papers from the 11th international conference on college teaching and learning (pp. 9–17), Jacksonville, Florida. Retrieved from ttp://www.classroomflip.com/files/classroom_flip_baker_2000.pdf

Barrie, S. C. (2012). A research-based approach to generic graduate attributes policy. *Higher Education Research and Development*, *31*(1), 79–92. https://doi.org/10.1080/07294360.2012.642842

Berge, A. N. Z. L., Nederveld, A., Berge, Z. L., & Nederveld, A. (2015). Flipped learning in the workplace. *Journal of Workplace Learning*, *27*(2), 162–172. https://doi.org/10.1108/JWL-06-2014-0044

Bergmann, J., Overmyer, J., & Wilie, B. (2011, July). The flipped class: Myths vs. reality. Retrieved from http://www.thedailyriff.com/articles/the-flipped-class-conversation-689.php

Bergmann, J., & Sams, A. (2014). Flip your classroom: Reach every student in every class every day. *Teaching Theology & Religion*, *17*(1), 82–83. https://doi.org/10.1111/teth.12165

Biggs. (1987). Student approaches to learning and studying. Research monograph. *Australian Education Research and Development*, 153. Retrieved from https://eric.ed.gov/?id=ED308201

Biggs, J. (1999). What the student does: Teaching for enhanced learning. *Higher Education Research and Development1*, *18*(1), 57–75.

Biggs, J. (2012). What the student does: Teaching for enhanced learning. *Higher*

Education Research and Development, *31*(1), 39–55. https://doi.org/10.1080/07294360.2012.642839

Bishop, J. L., & Verleger, M. A. (2013, June). *The flipped classroom: A survey of the research*. In 120th ASEE Annual Conference & Exposition (pp. 1–18), Atlanta, Georgia.

Bryson, C., & Hand, L. (2007). The role of engagement in inspiring teaching and learning. *Innovations in Education and Teaching International*, *44*(4), 349–362. https://doi.org/10.1080/14703290701602748

Byrd-Bredbenner, C., & Bauer, K. (1991). The development and evaluation of computer assisted instruction modules for an introductory, college-level nutrition course. *Journal of Nutrition Education*, *23*(6), 275–283. https://doi.org/10.1016/S0022-3182(12)80368-2

Çakıroğlu, Ü., & Öztürk, M. (2017). Flipped classroom with problem based activities: Exploring self-regulated learning in a programming language course. *Educational Technology & Society*, *20*(1), 337–349.

Carey, S. (1986). Cognitive science and science education. *American Psychologist*, *41*(10), 1123–1130. https://doi.org/10.1037/0003-066X.41.10.1123

Carvalho, H., & McCandless, M. (2014). Implementing the flipped classroom. *Revista Hospital Universitário Pedro Ernesto*, *13*(4). https://doi.org/10.12957/rhupe.2014.13946

Carvalho, H., & West, C. A. (2011). Voluntary participation in an active learning exercise leads to a better understanding of physiology. *AJP: Advances in Physiology Education*, *35*(1), 53–58. https://doi.org/10.1152/advan.00011.2010

Chen, F., Lui, A. M., & Martinelli, S. M. (2017). A systematic review of the effectiveness of flipped classrooms in medical education. *Medical Education*, *51*(6), 585–597. https://doi.org/10.1111/medu.13272

Chi, M. T. H. (2009). Active-Constructive-Interactive: A conceptual framework for differentiating learning activities. *Topics in Cognitive Science*, *1*(1), 73–105. https://doi.org/10.1111/j.1756-8765.2008.01005.x

Chickering, A. W., & Gamson, Z. F. (1999). Development and adaptations of the seven principles for food practice in undergraduate education. *New Directions*

for Teaching and Learning, *1999*(80), 75–81. https://doi.org/10.1002/tl.8006

Chin, C., & Brown, D. E. (2000). Learning in science: A comparison of deep and surface approaches. *Journal of Research in Science Teaching*, *37*(2), 109–138. https://doi.org/10.1002/(SICI)1098-2736(200002)37:2<109::AID-TEA3>3.0.CO;2-7

Crisp, N., & Chen, L. (2014). Global supply of health professionals. *New England Journal of Medicine*, *370*(10), 950–957. https://doi.org/10.1056/NEJMra1111610

Davies, R. S., Dean, D. L., & Ball, N. (2013). Flipping the classroom and instructional technology integration in a college-level information systems spreadsheet course. *Educational Technology Research and Development*, *61*(4), 563–580. https://doi.org/10.1007/s11423-013-9305-6

Day, J. A., & Foley, J. D. (2006). Evaluating a web lecture intervention in a human-computer interaction course. *IEEE Transactions on Education*, *49*(4), 420–431. https://doi.org/10.1109/TE.2006.879792

Deci, E. L., Koestner, R., & Ryan, R. M. (1999). A meta-analytic review of experiments examining the effects of extrinsic rewards on intrinsic motivation. *Psychological Bulletin*, *125*(6), 627–668. https://doi.org/10.1037/0033-2909.125.6.627

Donald, J. G. (2002). *Learning to think: Disciplinary perspectives*. *The JosseyBass higher and adult education series*. Retrieved from http://www.loc.gov/catdir/bios/wiley042/2001006384.html

Enfield, J. (2013). Looking at the impact of the flipped classroom model of instruction on undergraduate multimedia students at CSUN. *TechTrends: Linking Research & Practice to Improve Learning*, *57*(6), 1–14. https://doi.org/10.1007/s11528-013-0698-1

Entwistle, N., & Tait, H. (1990). Approaches to learning, evaluations of teaching, and preferences for contrasting academic environments. *Higher Education*, *19*(2), 169–194. https://doi.org/10.1007/BF00137106

Ferreri, S. P., & O'Connor, S. K. (2013). Redesign of a large lecture course into a small-group learning course. *American Journal of Pharmaceutical Education*, *77*(1). https://doi.org/10.5688/ajpe77113

Foldnes, N. (2016). The flipped classroom and cooperative learning: Evidence from a randomised experiment. *Active Learning in Higher Education*, *17*(1), 39–49. https://doi.org/10.1177/1469787415616726

Frambach, J. M., Van der Vleuten, C. P. M., & Durning, S. J. (2013). AM last page : quality criteria in qualitative and quantitative research. *Academic Medicine*, *88*(4), 552. https://doi.org/10.1097/ACM.0b013e31828abf7f

Fransson, A. (1977). On qualitative differences in learning: IV-effects of intrinsic motivation and extrinsic test anxiety on process and outcome. *British Journal of Educational Psychology*, *47*(3), 244–257. https://doi.org/10.1111/j.2044-8279.1977.tb02353.x

Freeman, S., Eddy, S. L., & McDonough, M. (2014). Active learning increases student performance in science, engineering, and mathematics. *Proceedings of the National Academy of Sciences*, *111*(23), 8410–8415. Retrieved from http://www.pnas.org/content/early/2014/05/08/1319030111.abstract%5Cnpapers2://publication/doi/10.1073/pnas.1319030111

Frenk, J., Chen, L., Bhutta, Z. A., Cohen, J., Crisp, N., Evans, T., Fineberg, H., Garcia, P., Ke, Y., Kelley, P., Kistnasamy, B., Meleis, A., Naylor, D., Pablos-Mendez, A., Reddy, S., Scrimshaw, S., Sepulveda, J., Serwadda, D., Zurayk, H. (2010). Health professionals for a new century: Transforming education to strengthen health systems in an interdependent world. *The Lancet*, *376*, 1923–1958. https://doi.org/10.1016/S0140-6736(10)61854-5

Fulton, K. (2012). Upside down and inside out: Flip your classroom to improve student learning. *Learning & Leading with Technology*, *39*(8), 12–17. https://doi.org/10.9707/2168-149X.1379

Galway, L. P., Corbett, K. K., Takaro, T. K., Tairyan, K., & Frank, E. (2014). A novel integration of online and flipped classroom instructional models in public health higher education. *BMC Medical Education*, *14*(1), 181. https://doi.org/10.1186/1472-6920-14-181

Gannod, G. C., Burge, J. E., & Helmick, M. T. (2008). Using the inverted classroom to teach software engineering. *Proceedings of the 13th international conference on Software engineering – ICSE '08* (p. 777). https://doi.org/10.1145/1368088.1368198

Garrison, D. R., & Kanuka, H. (2004). Blended learning: Uncovering its transformative potential in higher education. *Internet and Higher Education*, *7*(2), 95–105. https://doi.org/10.1016/j.iheduc.2004.02.001

Hagel, P., Carr, R., & Devlin, M. (2012). Conceptualising and measuring student engagement through the Australasian Survey of Student Engagement (AUSSE): A critique. *Assessment and Evaluation in Higher Education*, *37*(4), 475–486. https://doi.org/10.1080/02602938.2010.545870

Hannafin, M. J., Hill, J. R., & Land, S. M. (1997). Student-centered learning and interactive multimedia: Status, issues, and implication. *Contemporary Eduaction*, *68*, 94–99.

Hanson, J. (2016). Surveying the experiences and perceptions of undergraduate nursing students of a flipped classroom approach to increase understanding of drug science and its application to clinical practice. *Nurse Education in Practice*, *16*(1), 79–85. https://doi.org/10.1016/j.nepr.2015.09.001

Hawks, S. J. (2014). The flipped classroom: Now or never? *AANA Journal*, *82*(4), 264–269.

Herreid, C. F., & Schiller, N. A. (2013). Case studies and the flipped classroom. *Journal of College Science Teaching*, *42*(5), 63. https://doi.org/doi.org.proxy2.lib.umanitoba.ca/10.1

Hockings, C., Cooke, S., Yamashita, H., McGinty, S., & Bowl, M. (2008). Switched off? A study of disengagement among computing students at two universities. *Research Papers in Education*, *23*(2), 191–201. https://doi.org/10.1080/02671520802048729

Hutchings, M., & Quinney, A. (2015). The flipped classroom, disruptive pedagogies, enabling technologies and wicked problems: Responding to “the bomb in the basement”. *Electronic Journal of E-Learning*, *13*(2), 105–118.

Karabulut-Ilgu, A., Jaramillo Cherrez, N., & Jahren, C. T. (2017). A systematic review of research on the flipped learning method in engineering education. *British Journal of Educational Technology*. https://doi.org/10.1111/bjet.12548

Kember, D., & Leung, D. Y. P. (2005). The influence of active learning experiences on the development of graduate capabilities. *Studies in Higher Education*, *30*(2),

155–170. https://doi.org/10.1080/03075070500043127

Kim, M. K., Kim, S. M., Khera, O., & Getman, J. (2014). The experience of three flipped classrooms in an urban university: An exploration of design principles. *Internet and Higher Education*, *22*, 37–50. https://doi.org/10.1016/j.iheduc.2014.04.003

Kitzinger, J. (1994). The methodology of focus groups: The importance of interaction between research participants. *Sociology of Health & Illness*, *16*(1), 103–121. https://doi.org/10.1111/1467-9566.ep11347023

Koo, C. L., Demps, E. L., Farris, C., Bowman, J. D., Panahi, L., & Boyle, P. (2016). Impact of flipped classroom design on student performance and perceptions in a pharmacotherapy course. *American Journal of Pharmaceutical Education*, *80*(2), 1-9. https://doi.org/10.5688/ajpe80233

Krathwohl, D. R., Anderson, L. W., Airasian, P. W., Cruikshank, K. A., Mayer, R. E., Pintrich, P. R., & Wittrock, M. C. (2002). A revision of Bloom's Taxonomy: An overview. *Theory into Practice*, *41*(4), 212-218. https://doi.org/10.1207/s15430421tip4104_2

Lage, M. J., & Platt, G. (2000). The internet and the inverted classroom. *Journal of Economic Education*, *31*(1), 11. https://doi.org/10.1080/00220480009596756

Lage, M. J., Platt, G. J., & Treglia, M. (2000). Inverting the classroom: A gateway to creating an inclusive learning environment. *Journal of Economic Education*, *31*(1), 30–43. https://doi.org/10.1080/00220480009596759

Liebert, C. A., Lin, D. T., Mazer, L. M., Bereknyei, S., & Lau, J. N. (2016). Effectiveness of the surgery core clerkship flipped classroom: A prospective cohort trial. *The American Journal of Surgery 211*(2), 451–457.e1). https://doi.org/10.1016/j.amjsurg.2015.10.004

Lin, H.-F. (2007). Effects of extrinsic and intrinsic motivation on employee knowledge sharing intentions. *Journal of Information Science*, *33*(2), 135–149. https://doi.org/10.1177/0165551506068174

Littlewood, S., Ypinazar, V., Margolis, S. A., Scherpbier, A., Spencer, J., & Dornan, T. (2005). Early practical experience and the social responsiveness of clinical education: Systematic review. *BMJ*, *331*(7513), 387–391.

https://doi.org/10.1136/bmj.331.7513.387

Lowell Bishop, J., & Verleger, M. (2013). The flipped classroom: A survey of the research. *Proccedings of the Annual Conference of the American Society for Engineering Education*, 6219. https://doi.org/10.1109/FIE.2013.6684807

Lucariello, J. M., Nastasi, B. K., Anderman, E. M., Dwyer, C., Ormiston, H., & Skiba, R. (2016). Science supports education: The behavioral research base for psychology's top 20 principles for enhancing teaching and learning. *Mind, Brain, and Education*, *10*(1), 55–67. https://doi.org/10.1111/mbe.12099

Marton, F. (1983). Beyond individual differences. *Educational Psychology*, *3*(3–4), 289–303. https://doi.org/10.1080/0144341830030311

Mason, G. S., Shuman, T. R., & Cook, K. E. (2013). Comparing the effectiveness of an inverted classroom to a traditional classroom in an upper-division engineering course. *IEEE Transactions on Education*, *56*(4), 430–435. https://doi.org/10.1109/TE.2013.2249066

McLaughlin, J. E., Griffin, L. T. M., Esserman, D. A., Davidson, C. A., Glatt, D. M., Roth, M. T., Gharkholonarehe, N., Mumper, R. J. (2013). Pharmacy student engagement, performance, and perception in a flipped satellite classroom. *American Journal of Pharmaceutical Education*, *77*(9), 1-8. https://doi.org/10.5688/ajpe779196

McLaughlin, J. E., Roth, M. T., Glatt, D. M., Gharkholonarehe, N., Davidson, C. A., Griffin, L. M., Esserman, D. A., Mumper, R. J. (2014). The flipped classroom. *Academic Medicine*, *89*(2), 236–243. https://doi.org/10.1097/ACM.0000000000000086

Milman, N. B. (2012). The flipped classroom strategy: What is it and how can it best be used? *Distance Learning*, *9*(3), 85–89. https://doi.org/10.1097/NNE.0000000000000096

Missildine, K., Fountain, R., Summers, L., & Gosselin, K. (2013). Flipping the classroom to improve student performance and satisfaction. *Journal of Nursing Education*, *52*(10), 597–599. https://doi.org/10.3928/01484834-20130919-03

Moravec, M., Williams, A., Aguilar-Roca, N., & O'Dowd, D. K. (2010). Learn before lecture: A strategy that improves learning outcomes in a large introductory

biology class. *CBE Life Sciences Education*, *9*(4), 473–481. https://doi.org/10.1187/cbe.10-04-0063

Mortensen, C. J., & Nicholson, A. M. (2015). The flipped classroom stimulates greater learning and is a modern 21st century approach to teaching today's undergraduates. *Journal of Animal Science*, *93*(7), 3722–3731. https://doi.org/10.2527/jas.2015-9087

Nelson Laird, T. F., & Kuh, G. D. (2005). Student experiences with information technology and their relationship to other aspects of student engagement. *Research in Higher Education*, *46*(2), 211–233. https://doi.org/10.1007/s11162-004-1600-y

Nwosisi, C., Ferreira, A., Rosenberg, W., & Walsh, K. (2016). A study of the flipped classroom and its effectiveness in flipping thirty percent of the course content. *International Journal of Information and Education Technology*, *6*(5), 348–351. https://doi.org/10.7763/IJIET.2016.V6.712

O'Flaherty, J., & Phillips, C. (2015). The use of flipped classrooms in higher education: A scoping review. *Internet and Higher Education*, *25*, 85–95. https://doi.org/10.1016/j.iheduc.2015.02.002

Palinkas, L. A., Horwitz, S. M., Green, C. A., Wisdom, J. P., Duan, N., & Hoagwood, K. (2015). Purposeful sampling for qualitative data collection and analysis in mixed method implementation research. *Administration and Policy in Mental Health and Mental Health Services Research*, *42*(5), 533–544. https://doi.org/10.1007/s10488-013-0528-y

Pierce, R., & Fox, J. (2012). Vodcasts and active-learning exercises in a "flipped classroom" model of a renal pharmacotherapy module. *American Journal of Pharmaceutical Education*, *76*(10). https://doi.org/10.5688/ajpe7610196

Prince, M. (2004). Does active learning work? A review of the research. *Journal of Engineering Education*, *93*(3), 223–232. https://doi.org/10.1002/j.2168-9830.2004.tb00809.x

Prober, C. G., & Khan, S. (2013). Medical education reimagined: A call to action. *Academic Medicine*, *88*(10), 1407–1410. https://doi.org/10.1097/ACM.0b013e3182a368bd

Ramsden, P. (1988). Context and strategy: Situational influences on learning. In R. R. Schmeck (Ed.), *Learning Strategies and Learning Styles* (pp. 159–184). Retrieved from https://doi.org/10.1007/978-1-4899-2118-5_7

Roehl, A., Reddy, S. L., & Shannon, G. J. (2013). The flipped classroom: An opportunity to engage millennial students through active learning strategies. *Journal of Family & Consumer Sciences*, *105*(2), 44–49. https://doi.org/doi.org.proxy2.lib.umanitoba.ca/10.1

Rogoff, B. (2003). *The cultural nature of human development*. *The Cultural Nature of Human Development*. Retrieved from http://scholar.google.com/scholar?hl=en&btnG=Search&q=intitle:Development+as+Transformation+of+Participation+in+Cultural+Activities#9

Saldana, J. (2009). *The Coding Manual for Qualitative Researchers*. London, England: Sage Publications.

Sandelowski, M. (2000). Whatever happened to qualitative description? *Research in Nursing & Health*, *23*(4), 334–340. https://doi.org/10.1002/1098-240X(200008)23:4<334::AID-NUR9>3.0.CO;2-G

Shea, P., Hayes, S., Smith, S. U., Vickers, J., Bidjerano, T., Pickett, A., Gozza-Cohen, M., Wilde, J., & Jian, S. (2012). Learning presence: Additional research on a new conceptual element within the community of inquiry (CoI) framework. *Internet and Higher Education*, *15*(2), 89–95. https://doi.org/10.1016/j.iheduc.2011.08.002

Shimamoto, D. N. (2012). Implementing a flipped classroom: An instructional module. *Technology, Colleges, and Community Worldwide Online Conference*. Retrieved from http://scholarspace.manoa.hawaii.edu/bitstream/10125/22527/1/ETEC690-FinalPaper.pdf

Sofaer, S. (1999). Qualitative methods: What are they and why use them? *Health Services Research*, *34*(5 Pt 2), 1101–1118.

Stewart, D. W., & Shamdasani, P. N. (1990). *Focus groups: Theory and practice*. Thousand Oaks: Sage Publications.

Strayer, J. F. (2012). How learning in an inverted classroom influences cooperation,

innovation and task orientation. *Learning Environments Research*, *15*(2), 171–193. https://doi.org/10.1007/s10984-012-9108-4

Ten Cate, O., Kusurkar, R., & Williams, G. (2011). How self-determination theory can assist our understanding of the teaching and learning processes in medical education. AMEE guide No. 59. *Medical Teacher*, *33*(12), 961–973. https://doi.org/10.3109/0142159X.2011.595435

Trost, J. E. (1986). Statistically nonrepresentative stratified sampling: A sampling technique for qualitative studies. *Qualitative Sociology*, *9*(1), 54–57. https://doi.org/10.1007/BF00988249

Tucker, B. (2012). The flipped classroom: Online instruction at home frees class time for learning. *Education Next, 12*(1), 82-83.

Vermunt, J. D., & Verloop, N. (1999). Congruence and friction between learning and teaching. *Learning and Instruction*, *9*(3), 257–280. https://doi.org/10.1016/S0959-4752(98)00028-0

Vygotsky, L. S. (1986). Thought and language. *The Journal of Mind and Behavior*, *8*(1), 168. https://doi.org/10.1037/11193-000

Warburton, K. (2003). Deep learning and education for sustainability. *International Journal of Sustainability in Higher Education*, *4*(1), 44–56.

Wigfield, A., Eccles, J. S., & Rodriguez, D. (1998). The development of children's motivation in school contexts. *Review of Research in Education*, *23*(1), 73–118. https://doi.org/10.3102/0091732X023001073

Wood, K., Jensen, D., Bezdek, J., & Otto, K. (2001). Reverse engineering and redesign: Courses to incrementally and systematically teach design. *Journal of Engineering Education*, *90*(3), 363–373. https://doi.org/10.1002/j.2168-9830.2001.tb00615.x

Young, T., Bailey, C., Guptill, M., Thorp, A., & Thomas, T. (2014). The flipped classroom: A modality for mixed asynchronous and synchronous learning in a residency program. *Western Journal of Emergency Medicine*, *15*(7), 938–944. https://doi.org/10.5811/westjem.2014.10.23515

Zainuddin, Z., & Halili, S. H. (2016). Flipped classroom research and trends from different fields of study. *International Review of Research in Open and Distance*

Learning, *17*(3), 313–340. https://doi.org/10.19173/irrodl.v17i3.2274

Appendix A

Application of the nine design principles for flipped classrooms (Kim et al., 2014) during the current study

Kim et al (2014) proposed nine design principles for flipped classrooms that emerged from their data after they examined three instances of the flipped classroom across three disciplines.

These principles were applied as presented in the table below during the design of the flipped classrooms for the purpose of the current study:

	Design Principles (Kim et al., 2014)	**How the principles were applied**	**Notes**
1.	Provide an opportunity for students to gain first exposure prior to class	Each of the four flipped lectures were designed to consist of a pre-class session with a subsequent face-to-face session. The respective learning content addressed during these two sessions was in alignment, ensuring the opportunity to engage with the content of the pre-class session during the face-to-face contact time.	Pre-class sessions would cover basic concepts and theory that would prepare students for specific clinical skills associated with the theory. The pre-class learning material would make reference to the relevance of the content covered in that session for the subsequent contact session. For example, the factors to consider when compiling a speech screener were addressed by means of a podcast on the topic in the pre-class session. In the podcast, the lecturer would inform the students about the planned

			learning activity for the following contact session, which was to compile a screener, and how the information from the podcast would be utilised.
2.	Provide an incentive for students to prepare for class	The face-to-face learning activities were carefully planned to ensure that: • Contact time is not a repetition of the content covered in the pre-class sessions • The tasks in class required knowledge that was covered in the pre-class session Additionally, time was made available for the pre-class learning activities in an attempt to encourage students to complete them. Refer to number 6 for more information. Lastly, a quiz about the content covered in the pre-class session was presented at the start of each face-to-face session. Refer to number 3 for more information.	Students reported during the focus groups that the quizzes served as powerful incentives to prepare for the contact time.
3.	Provide a mechanism to assess student understanding	The activities of the face-to-face sessions were intentionally designed to reveal students' readiness to apply knowledge and practice the	The quizzes were hosted on: www.socrative.com Participation in the quizzes was never announced as compulsory, but rather presented as a learning

		clinical skills associated with the theory addressed in the pre-class sessions. Typically, the contact time was planned to start with a quiz to reveal students' grasp of the pre-class learning content, followed by opportunities to apply the theory from the pre-class sessions and practise associated clinical skills. **However**, it is important to note that careful attention was paid to ensure that these formative assessment opportunities: • Were not observed by students as mechanisms to "catch out" those who did not complete the pre-class sessions • Were communicated as opportunities to learn • Provided ample opportunity for valued feedback from peers and the lecturer to promote conceptual growth and conceptual change	opportunity following and building on the pre-class session that students were encouraged to utilise. Students participated anonymously (Socrative provides for this setting) and although the lecturer did not initially plan it, the quizzes turned out to elicit quite some discussion and speculation while students were engaging with the questions. Although the natural inclination would be to discourage discussion during an assessment, the lecturer soon realised that this in fact promoted peer feedback and served as a collaborative learning exercise, in line with the goal of the face-to-face sessions. Students participated by means of their cell phones, responding to pre-compiled multiple choice questions that were projected against the wall. Socrative was set up to show the correct answers directly after each question, before proceeding to the next one. The percentages of students who selected each respective answer of

			the particular multiple choice question (correct or incorrect) were also indicated.
4.	Provide clear connections between in-class and out-of-class activity	This was achieved through absolute alignment of the content covered during the pre-class sessions and the learning activities during contact time. See the last column for more information on how this was done.	Plan for reflection opportunities to optimise the benefits of metacognitive activity that the flipped classroom offers.
5.	Provide clearly defined and well-structured guidance	An introductory and orientation podcast was developed and shared with students prior to the first flipped lecture. This podcast presented the motivation for adopting a new instructional model, explained the nature of this teaching and learning model and communicated clear expectations to students about their role and responsibilities. In addition, the podcast contained information about available support in terms of the online learning management system, as well as general IT support. Each out-of-class session presented clearly defined learning outcomes, and a brief	

		orientation, outlining the sequence of learning activities and reference to handy resources, or additional information. At the start of each face-to-face session, students were informed what the session would entail and how it related to the pre-class content. Finally, an open communication channel and timely responses to emails or questions via the online learning management system were prioritised by the lecturer.	
6.	Provide enough time for students to carry out the assignments	It was anticipated that utilising all the allocated time on the timetable as class time for the face-to-face sessions would negatively impact students' participation in the pre-class sessions that they were expected to complete in their own time. As a result, time was allocated on the first-year students' timetable for the pre-class sessions. Time was also managed carefully in terms of the face-to-face sessions, since it was important to be realistic when planning the contact time	The course used for the study is usually taught once a week during four consecutive hours. Although the students had the freedom to complete the pre-class sessions at any time that they preferred (warranted that it was done prior to the face-to-face sessions), the first two hours of each lecture were allocated on the timetable for this purpose. The face-to-face sessions took place during the last two hours.

		activities to ensure enough time for feedback and consolidation, otherwise the purpose of these sessions would be defeated. See number 8 for more information.	
7.	Provide facilitation for building a learning community	Contact sessions were planned to provide opportunity for students to learn from each other. Attention was paid to creating an encouraging and positive atmosphere where students had the opportunity to experience success in terms of the learning outcomes, but would also feel safe to share their ideas and/or ask questions and dare to be critical about the content.	The quizzes, in the end, provided the opportunity for the lecturer to respond to students' incorrect responses in a positive manner, redirecting potential negative emotions about failure towards the value of the learning opportunity. In addition, the fact that Socrative revealed the statistics about all the correct and incorrect responses, fostered a feeling of relatedness.
8.	Provide prompt/adaptive feedback on individual or group work	Contact time activities were planned in such a way that time was available for ongoing and immediate feedback during the face-to-face sessions. If the contact time was to be jam-packed with back- to-back activities with no time for in-depth discussions or critical engagement, the flipped classroom's true value would be lost. Not having time for questions, discussions and problem solving with the lecturer as facilitator	Be sure to utilise a venue suitable for interaction and collaboration during the contact time. The venue for the current study's contact sessions was booked in advance and proved not to be conducive for small group work or discussions. A room with freestanding tables and chairs and enough space to break away in smaller groups would be ideal.

		(which is exactly what the flipped classroom aims to offer), would equate to students working in groups in their own time, without any input from a lecturer until after the assignment was submitted for grading.	
9.	Provide technologies familiar and easy to access	For this course, iSpring software was utilised to create the podcasts, since it could be incorporated in the online learning management system that the students were familiar with and were using for all their other modules.	Students were not apprehensive about using their cell phones for the quizzes at all.

Source: Kim, M.K., Kim, S.M., Khera, O. & Getman, J. (2014). The experience of three flipped classrooms in an urban university: An exploration of design principles. *Internet and Higher Education*, *22*, 37–50.

Appendix B

QR code to view one of the podcasts employed as pre-class teaching material

---

If you do not have an application to read QR codes on your phone, please download a free QR code reader from the Play Store (android) or iStore (OS) on your smartphone. Once downloaded, open the application and scan the QR code above and follow the prompts to be redirected to the podcast on YouTube.

Alternatively, type the following URL into your browser to access the podcast on YouTube:

https://www.youtube.com/watch?v=BXjATZraCUs

Appendix C

Discussion schedule

Background and Introduction:

Over the past few weeks, you have been exposed to the flipped classroom for the Speech Pathology 142 module. Each week you engaged online with the learning content and subsequently in class had the opportunity to apply your knowledge and practise what you have learnt.

You are halfway through the module. Today we are going to discuss and reflect on how you have experienced this way of learning during this first part of the module.

COGNITIVE

Introductory question:

Did this way of teaching and learning promote your learning? How?

Prompts:

- How did it help you to attain the learning outcomes (learn what you have to learn from this module)?
- How did it prepare you for your work with children next year at the prac and once you are a qualified therapist?
- Did you find the contact time valuable? Why or why not?

AFFECTIVE

Introductory question:

Did you enjoy this way of teaching and learning? Why? OR Why not?

Prompts:

- What did you like about this way of teaching and learning and why?
- What did you not like about it and why?
- Are you more interested in learning about this subject after doing this module? Why? OR Why not?

REGULATIVE

Introductory question:

During the past few weeks, did you at any point reflect on your learning? Tell me about that.

Prompts:

- Did you consider your progress in the module, in other words, whether you were attaining the set learning outcomes? How did you consider it?
- Did this method of teaching impact or change your learning process in any way? If yes, how?

Appendix D

Participant information leaflet and consent form

TITLE OF THE RESEARCH PROJECT:

The influence of a flipped classroom on the learning approaches of first-year Speech-Language and Hearing Therapy students.

REFERENCE NUMBER: S17/03/052

PRINCIPAL INVESTIGATOR: Monique Visser

ADDRESS: PO Box 241, Cape Town, 8000

CONTACT NUMBER: 021 938 9494

You are invited to participate in a research project. Please take some time to read the information presented here, which will explain the details of this project. Please ask the researcher or focus group facilitator any questions about any part of this project that you do not fully understand. It is very important that you are fully satisfied that you clearly understand what this research entails and how you could be involved. Also, your participation is entirely voluntary and you are free to decline to participate. Should you decline, it will not impact on you negatively in any way whatsoever. You are also free to withdraw from the study at any point, even if you do agree now to participate.

This study has been approved by the Health Research Ethics Committee at Stellenbosch University and will be conducted according to the ethical guidelines and principles of the international Declaration of Helsinki, South African Guidelines for Good Clinical Practice and the Medical Research Council (MRC) Ethical Guidelines for Research.

What is this research study about?

The study will be conducted in Stellenbosch. The aim of the study is to investigate the influence of a specific teaching strategy, namely the flipped classroom, on students' approaches to learning. Four of the lectures of the module SPH 142 were presented in the flipped classroom format, each consisting of an online component and a contact session. The study will entail that participants complete a questionnaire about their engagement and experience during these flipped classrooms.

This questionnaire has a number of questions about your attitudes towards your studies and your usual way of studying. There is no right way of studying, it depends on what suits your own style and the course you are studying. Your responses will be anonymous.

Why have you been invited to participate?

All the first-year Speech-Language and Hearing Therapy students from Stellenbosch University who are registered for the module Speech Pathology 142 during the 2017 academic year and participated in all four the flipped classroom sessions, are invited to participate.

What will your responsibilities be?

You will be required to complete the questionnaire about your learning experiences and activities as a result of the flipped classrooms. It will take approximately 10 minutes of your time.

Will you benefit from taking part in this research?

The procedures of the study will present no real benefits to the participants.

Are there in risks involved in your taking part in this research?

The procedures of the study will pose no risks to the participants.

Who will have access to your information?

No personal or academic information will be collected or used during this study. The information that you choose to provide during the focus group discussions, will be anonymised during transcription by a research assistant.

The researcher herself will not have access to any identifiable information. The results of the study will be made available to the Undergraduate Programme Committee of Baccalaureus of Speech-Language and Hearing Therapy as well as to the participants in a summary report. In addition, should the researcher publish the findings or present the results at conferences, she will do so without including any identifying information about the participants or the University to protect the parties involved.

What will happen in the unlikely event of some form of injury occurring as a direct result of your taking part in this research study?

It is highly unlikely that participants will suffer any form of injury as a result of this study as it entails only a group discussion.

Will you be paid to take part in this study and are there any costs involved?

No, you will not be paid to take part in the study and there will be no costs involved for you, if you do take part.

Is there anything else that you should know or do?

You can contact the Health Research Ethics Committee at 021-938 9207 if you have any concerns or complaints that have not been adequately addressed by the researcher or research assistant.

You will receive a copy of this information and consent form for your own records.

Declaration by participant

By signing below, I ……..……. agree to take part in a research study entitled (insert title of study).

I declare that:

- I have read or had read to me this information and consent form and it is written in a language with which I am fluent and comfortable.
- I have had a chance to ask questions and all my questions have been adequately answered.
- I understand that taking part in this study is voluntary and I have not been pressurised to take part.
- I may choose to leave the study at any time and will not be penalised or prejudiced in any way.
- I may be asked to leave the study before it has finished, if the researcher feels it is in my best interests, or if I do not follow the study plan, as agreed to.

Signed at (place) .....…..…….. on (date) ……...…….. 2017.

.....…..…..
Signature of participant

.....…..……..
Signature of witness

Declaration by investigator

I (name) ……..…… declare that:

- I explained the information in this document to ……..
- I encouraged him/her to ask questions and took adequate time to answer them.
- I am satisfied that he/she adequately understands all aspects of the research, as discussed above.
- I did not use an interpreter.

Signed at (place) .....…..…….. on (date) ……...…….. 2017.

.....…..…..
Signature of participant

.....…..……..
Signature of witness